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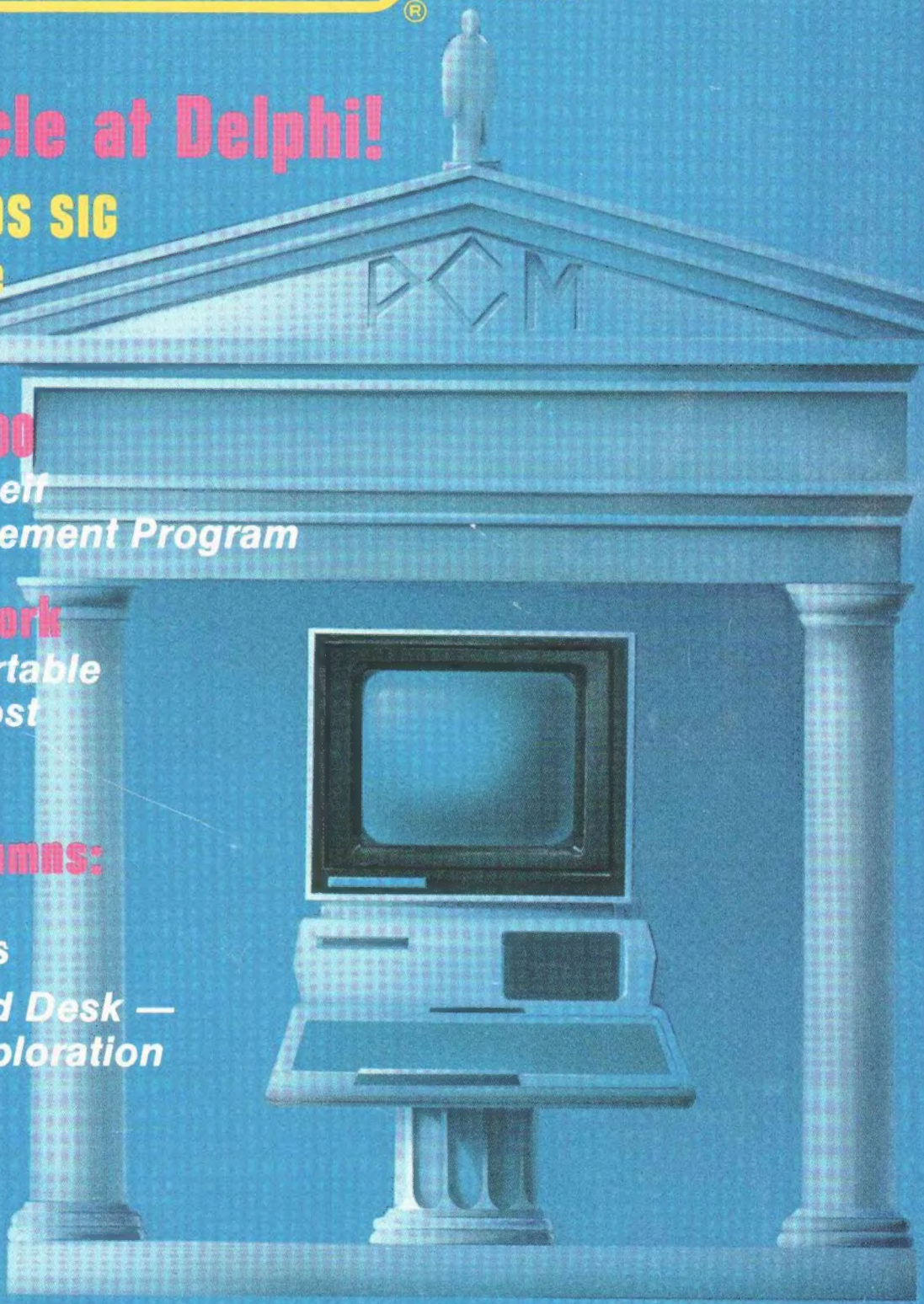

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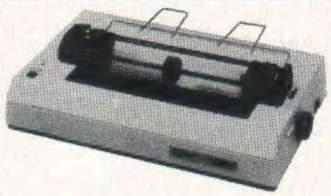

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Reviews Editor E. Monica Dorth
Editorial Assistants Wendy Falk, Judi Hutchinson, Shirley Morgan
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Typography Services Jody Doyle, Angela Kapfhammer, Suzanne Banish Kurowsky

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Advertising Coordinator Doris Taylor
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(502) 228-4492
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CAPACITIES:			
Fields per record	100	32	999 ✓
Characters per record	1679	1000	4608 ✓
Records per file	1300	65535	16,000,000 ✓
Indexes per file	1	7	12 ✓
Number of digits per numeric field	20	10	24 ✓
Number of files usable concurrently	1	2	10 ✓
Files span multiple drives	no	no	up to 8 ✓
FEATURES:			
Full-screen facility for creating custom screen layouts	yes	no	YES ✓
Full-screen facility for creating custom report layouts	no	no	YES ✓
Built-in field types (error checking)	no	3	12 ✓
User-defined field types	no	programmer required	200 ✓
Conditional math	no	programmer required	YES ✓
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An Oracular Spectacular:

Tune in our New Delphi SIG

One of the things we've been wanting to be involved with for a long number of years has finally come to pass. We're very happy about it and I think you will be, too, because it means an expanded capability for you and your computer.

Here at PCM, we figure that we are in the communications business. That is, we believe our primary goal is to communicate things to others; while, at the same time, allow others to share information with one another.

I happen to think we do all this pretty well (and the mail I get from many of you seems to indicate agreement) but there has always been a wish that we could do it better. Now, I think we have a way.

By the time you read this, we will be heavily involved in supplying information to you through a telecommunications capability. We have selected the Delphi network for a number of reasons I will not go into here, but suffice it to say that now you can call up Delphi and join our MS-DOS Special Interest Group (or SIG).

There is no initial cost — either for the first hour on Delphi, for joining Delphi, or for joining the MS-DOS SIG — if you're a PCM subscriber. If you are not, then you can subscribe and get the same benefits. There is detailed information elsewhere in this issue.

Delphi connect time is inexpensive after your first free hour. Just $6 an hour, even at 1200 Baud. But best of all, it offers a two-way communications medium for you and for us. You'll be able to leave your questions on the forum and get answers; you'll be able to communicate in real time with many of our columnists through the conference; you'll be able to participate in polls (and create your own); and, you'll be able to download programs which appear in PCM for a small fee *as well as* have the ability to access a host of free programs from other users of the service.

Leave us a "letter to the editor" on Delphi. And, if it has a question, we'll try to answer. Or, maybe some other member of the SIG will. We'll still print those we think have wide appeal. But your answers should come faster.

"Talk" directly to Bill Barden, Danny Humphress or a host of other people involved with PCM! We'll post conference schedules on the SIG, but we'll also print preliminary schedules in the magazine itself.

Truly, I think Delphi opens a whole new world to us. And, for the first time, will give you an alternate way to obtain program listings from our pages quickly and easily — without having to type them in. Yes, we're still planning on a disk service at some time in the future, too.

But Delphi isn't the only new outreach program we'll offer. In cooperation with CompuServe, you can now get listings from PCM through their SOFTEX service. As at Delphi, there is a small cost here, too.

We're excited about the new things we will be doing because we see our association with Delphi and with CompuServe as an extension of PCM. We especially hope you'll take advantage of (at least) the free hour of connect time on Delphi and "meet us" in person.

Everyone here at PCM looks forward to hearing from you and sharing information with you. Tune in and say "hello!"

I can't resist mentioning that a number of months ago I reported here that Tandy's super *DeskMate* program would be available for other machines in its line, too. *DeskMate* has been announced for the 2000, as well as the Color Computer and the Model IV. Our new monthly *DeskMate* column called "The Integrated Desk," starting with this issue, will help you make the most of this program.

Now, watch for us to provide you with more excitement in the months to come.

— Lonnie Falk

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File Transfer Mode			
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Wildcard File Transfers	Yes	Yes	Yes
File Transfer Lists	Yes		
XMODEM Protocol Support	Yes	Yes	Yes
Mainframe Versions Available	Yes		
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Program Run	Yes	Yes	
Subroutines	Yes		
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REDEFINING KEYS

Editor:

I have enjoyed all of Danny Humphress' articles on MS-DOS. He writes so that I not only understand, but I also enjoy reading them. His latest DOSsier, "Exploring ANSI.SYS" (September 1985, Page 72), was of particular interest to me. Ever since I bought my Tandy 2000 I have wanted to redefine my keyboard for one-handed operation in the arrangement developed by Commander August Dvorak, USNR. I have an electric typewriter with that arrangement and it has me completely spoiled.

I used Mr. Humphress' procedure and have written the program as an AUTOEXEC.BAT file so the keyboard is redefined on start-up. It does a fine job, except it is only effective while in MS-DOS. When I run my word processor (*My Word*), the keyboard reverts back to the old arrangement. When I again return to the system, the keyboard returns to the redefined state. Is there any way to retain the redefined keyboard when running this program?

James W. Young
Aberdeen, WA

Editor's Note: Unfortunately, the redefined keyboard only works while in MS-DOS command mode or in a program that uses ANSI's keyboard driver. There are a number of commercially available programs, however, that will allow you to redefine keys. Borland International's ProKey *is the one I use most often.*

DESPERATELY SEEKING SCREEN DUMP

Editor:

I read PCM every month and I am very glad to see it growing. I started with a Tandy Color Computer and purchased my Tandy 1000 the first week it was available.

I am interested in finding a graphics screen dump program for the Tandy 1000 that will print graphics on a Prowriter 8510A. There must be one out there somewhere. I have looked through PCM and IBM magazines and have not found one yet. Could one of the readers suggest a source for a program like this (commercial or public domain)? Send response to 4730 Robert Frost Way, 95842.

I have purchased many books for IBM BASIC and PC-DOS since there are not many Radio Shack or third party books available for the Tandy 1000 yet. All of the books or products have been very useful. The Tandy 1000 emulates the IBM PC and PC*jr* so well it's like having two computers in one. Most of the information in these books applies directly to the Tandy 1000, so don't worry if it says IBM. Anyone who has a Color Computer and a Tandy 1000 should consider buying the program *CoCo-Util* from Mark Data products. This program is an excellent package that allows file transfer between these two fine computers.

Steve Batson
Sacramento, CA

TANDY/IBM DIFFERENCES

Editor:

My first subscription issue of PCM arrived [August 1985]. Now I don't have to hunt the magazine racks every month looking for the latest issue. I like PCM very much and find something of value in every issue.

I have some questions — and these may be of interest to other Tandy 1000 owners.

- I have included a printout of the directories of both the Tandy 1000, MS-DOS 2.11 disk and the IBM PC-DOS 2.10. The sizes of the various files are quite different and, in most cases, the ones on the Tandy 1000 disk are larger. The most extreme example is MODE.COM (32,910K on the Tandy; 3,139K on PC-DOS). Why the size discrepancy? To my knowledge, there is no difference in EDLIN.COM between the two systems, so why the size difference?

This raises another question: Can I mix and match these files? That is, suppose I use MODE.COM from PC-DOS instead of the Tandy 1000 version, what would happen?

- The salespeople at my local Radio Shack Computer Center say the internal hard drive for the 1000 cannot be retrofitted to my 1000. Instead, they say I will have to use the external hard drive. OK, but this weekend, I helped a friend install the Quibie 20-megabyte drive in her Corona. It comes with a short disk controller card that fits in the 1000. And, it costs only $599!

No one can tell me if the power supply in the 1000 will stand up to the demands of a hard drive. The article in the August issue on networks mentioned you have 1000s with hard drives. What are your feelings on the adequacy of the 1000's power supply?

I have installed a PBJ 512K board and would like to install the Quibie 20-megabyte drive. Would that put too big a load on the power supply?

- In the "MS-DOSsier" column, you mention a device driver, available through the Tandy Express Order Software, that sets up a RAM disk. The people at the local Radio Shack Computer Center have no idea what that might be. Could you help us out and give us the name?

Robert P. Johnson
Seattle, WA

Editor's Note: Unlike most of the external MS-DOS commands, MODE *is usually supplied by the hardware vendor. The versions of* MODE *for IBM and Tandy have different features and were developed separately. I have used IBM's* MODE *on a Tandy 1000 with no problems, however.*

As far as I can determine, the power supply in the Tandy 1000HD is of the same wattage as the one in the non-hard disk 1000. If you are considering installing a third-party drive, I would suggest purchasing it from a vendor that specifically supports the Tandy 1000.

The RAM disk emulation software driver mentioned in the September 1985 "MS-DOSsier" is called RAMDisk-MS, *Radio Shack Express Order No. 90-0146, 29.95.*

OOPS!

Editor:

There is an error in the listing of my program in the September 1985 issue of PCM. On Line 120 of Page 30, the last command should be FI=3. I would be happy to respond to inquiries that are accompanied by a self-addressed, stamped envelope. My address is 1000 N. Oak Avenue, 54449.

John W. Melski, M.D.
Marshfield, WI

MOVIN' ON UP

Editor:

I started with a Tandy Color Computer and think the upgrade to the Tandy 1000 and PCM was worth the investment. Keep up the good work. It is greatly appreciated.

Bill Barden's article "The Sounds of Science" (September 1985, Page 11), was most amusing.

I would like to see a review of *CoCo-Util* from Mark Data Products. I have a need to transfer files from a Color Computer to a Tandy 1000, and would like an unbiased opinion before I purchase it.

Roy W. Osborne II
Council Bluffs, IA

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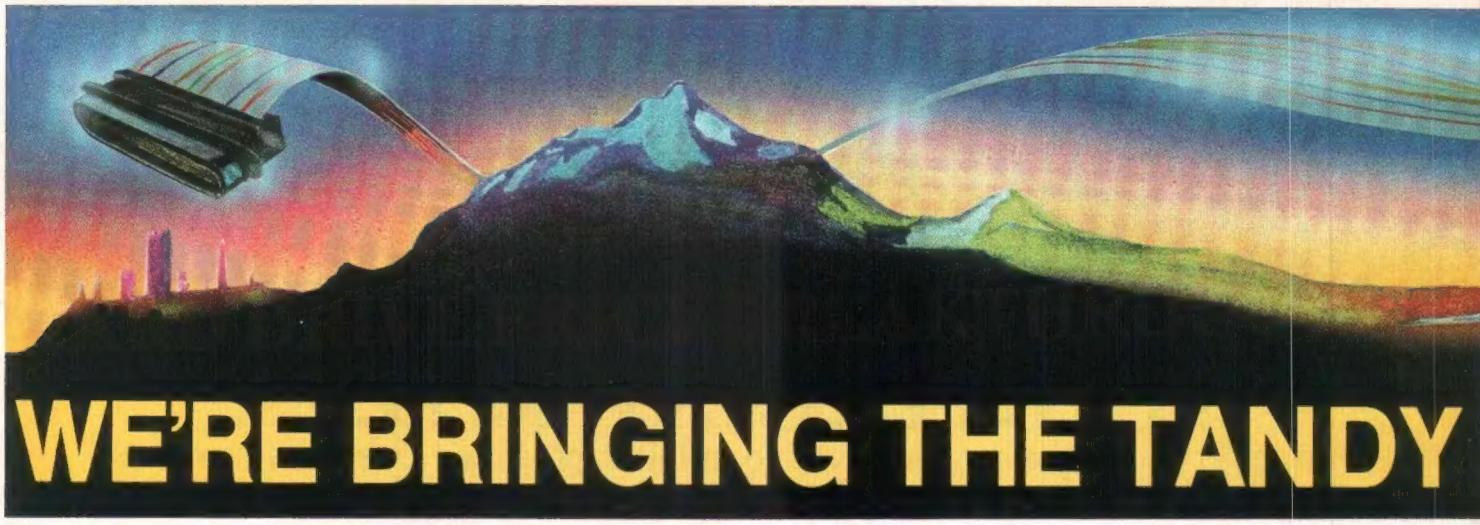


WE'RE BRINGING THE TANDY

PCM's BROADENING ITS SPECTRUM

PCM and the Delphi Information Utility have joined together to allow Tandy MS-DOS owners all over the world to connect with one another!

Delphi is a full-service information utility. It offers everything from up-to-the-minute news stories from The Associated Press to electronic mail services. But, *best of all*, it now has **a special forum for owners of MS-DOS computers, and it's operated by the people who bring you PCM each month.**

The MS-DOS Special Interest Group (SIG) features a variety of services, including an open forum where you can send and receive messages from Tandy owners all over the world. It also has databases for exchanging programs, where you can upload your favorites and download programs written by other Tandy MS-DOS enthusiasts.

THE WORLD OF MS-DOS

The MS-DOS SIG's conference feature allows you to meet electronically with other members of the Tandy Community. You can join conferences with many notables in the world of MS-DOS on a regular basis. Conference schedules will appear in PCM each month. Be sure to check online announcements for changes and additions.

PCM ONLINE

On Delphi, You can renew your PCM subscription, make a fast and easy order for software or hardware from a multitude of vendors, or inquire about products on the MS-DOS SIG.

We also have a number of **programs that you can download** and use, just for the cost of the time you spend transferring them. There'll also be **corrections for PCM articles**, helpful hints and many other useful features.

FREE LIFETIME MEMBERSHIP

PCM is offering subscribers a free lifetime subscription to Delphi — a $29.95 value — and a free hour of connect time — a $6 value at either 300 or 1200 Baud during evening, holiday and weekend hours — so you can sample Delphi and the brand new PCM MS-DOS SIG. **That's right. Your subscription to PCM entitles you to this $35.95 value as a *free bonus!***

If you're not a PCM subscriber, just enter your order when you sign on with Delphi and you'll get the same great deal! For our $28 subscription fee, you'll get the finest Tandy computer magazine ever, a free lifetime subscription to Delphi and a free hour of connect time.

SAVE EVEN MORE

Want to save an extra $15? While you're online, you can order the *Delphi Handbook and Command Card* ($21.95) and three hours of connect time ($18) for only $24.95.

Delphi provides us all with **Immediate Tandy Community**. Check it out today. After all, you can sample it for free!

DELPHI TYPE: GROUP MSDOS

How to reach the MS-DOS SIG on Delphi . . .

There are several ways to connect to Delphi and PCM's MS-DOS SIG. In most cities you will not even have to pay long distance charges; you can use special data communications networks, like Uninet, Tymnet and the Canadian Datapac network.

First, set your terminal program to operate at either 300 or 1200 Baud (depending on the modem you have), and also select either 7 bits with even parity or 8 bits with no parity, and 1 stop bit. (If one combination doesn't work, try another.)

Decide which network you should use (there is no surcharge for any of them, unless you have to make a long-distance call) and follow the instructions below:

On Uninet: Call (800) 821-5340 to get the Uninet number for your area. After you call the appropriate number for your own area and make connection, press ENTER, the period key (.) and ENTER again. At the "service:" prompt, type GVC (for General Videotex Corporation) and ENTER.

On Tymnet: Call (800) 336-0149 to get the Tymnet number for your area. After you dial your designated number and make connection, simply press 'A' no matter what appears on the screen. When "please log in:" appears, type DELPHI and press ENTER.

From Canada (on Datapac): Call Delphi Customer Service at (617) 491-3393 to get the Datapac number for your area. After you connect, press the period key (.) and ENTER (use two periods if you're using 1200 Baud). Type SET 2:1, 3:126 and press ENTER. Now type p 1 3106, DELPHI; and press ENTER.

From other countries: Many countries have their own data networks that can connect to either Uninet or Tymnet. Check with the telephone authorities in your country for details on how to sign up for this service. When you have an account set up, you can reach Delphi with a "host code" of 312561703088 through Uninet, or 310600601500 through Tymnet. (You'll have to pay the toll charges for this connection.)

Type in Your User Name

If you're already a subscriber to PCM, at the "USERNAME:" prompt, type PCMSUB and press ENTER. At the "PASSWORD:" prompt, type your individual subscription number from the mailing label of your latest issue of PCM. (If there are one or more zeros at the beginning of this number, include them.)

If you don't already have a subscription, at the "USERNAME:" prompt, type PCMORDER and press ENTER. At the "PASSWORD:" prompt, type SENDSUB and press ENTER. Have your MasterCard, VISA or American Express card ready, because you'll be led through a series of questions that will enable us to put your PCM and Delphi subscriptions into effect. In an effort to hold down non-editorial costs, we do not bill for subscriptions.

If you make a typing error, just press ENTER and start over. Remember that at any point, when you're on Delphi, you can type HELP to get help on how to use the system. To get off the system just type BYE.

If you find that you're unable to log onto Delphi and enter the MS-DOS SIG after following these instructions, call us during afternoon business hours at (502) 228-4492. We'll be glad to offer assistance.

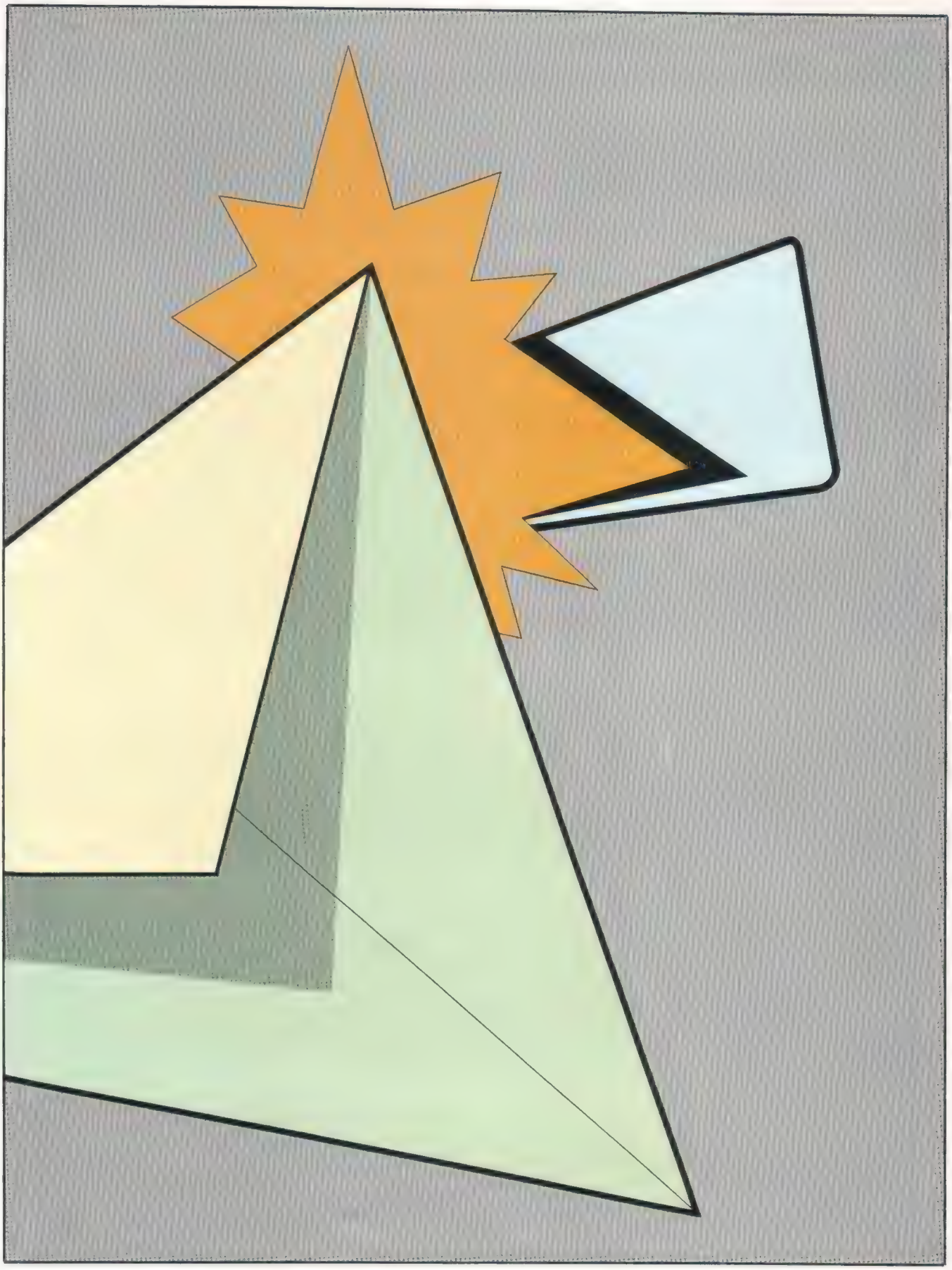
Come Visit Us! Type: GROUP MSDOS

After you sign in, you'll be prompted to set up your own, personal "user name" — Delphi is a friendly service, no numbers to remember — and you'll be asked a number of questions so Delphi can set up your account. You'll also be assigned a temporary password. No time is assessed against your free hour of service while you answer these questions.

Delphi will tell you that your account will be ready after 6 p.m. the same day if you sign up before noon (Eastern time zone.) If not, your account will be ready at 6 p.m. the next day. Once an account is opened, *each PCM subscriber will be credited with an hour of free time!*

When you log back in, use your chosen user name and your temporary password to access the system. At that point, you will meet Max, who will help you configure things and will change your temporary password into your own *personal* password. This is the password you will use for subsequent sessions — or until you change it. Again, there is *no charge* for the time you spend configuring your account. Your hour of free time starts after Max bids you goodbye.

You'll wind up at the Delphi Main Menu; type in GROUP MSDOS and **join us on the MS-DOS SIG!**



Produce labels with ease with this handy BASIC program

The Fantastic Label Machine

By Roger F. Krueger

TAG'R is a small program written in Model 100/200 BASIC that may come in handy for anyone who has a need to print multiple labels. The printer control codes are set for the Tandy DMP-200 printer but may be easily adjusted to accommodate other printers.

At home, I use the program to print return labels and address labels for any bills or payments that occur on a regular basis. Rent, car payments, insurance premiums and water bills are some that seem to pop into our mailbox on a regular basis. I'm sure you can think of others. And since my handwriting seems to be a cross between that of a doctor's and a preschooler's I much prefer using peel-off labels for those important checks which my wife and I send through the mail.

In addition to the options for printing standard sized labels in a "one-up" or "two-up" format, I have included a routine which I call "stencil" that can be used for larger labels ($5\frac{3}{4}$" by $2\frac{15}{16}$") which are very handy for mailing large envelopes and packages.

And now some comments about the program and how it works. *TAG'R* is an easy-to-use, menu driven program without many bells and whistles. When first run, the program presents a short two-part title screen followed by the main menu which offers five options: 1) Enter Data, 2) Save to RAM, 3) Load from RAM, 4) Select and 5) Quit. To start, select Option 1, Enter Data, and you will be greeted by the message: (Press ENTER when finished).

At this point, it is simply necessary to enter the address one line at a time up to a maximum of five lines. After the fifth line, you will have the option of correcting the entry by entering it again or continuing to the next address by selecting Y or N. When you have finished entering the addresses you need (to a maximum of 20), pressing ENTER at the LINE 1. prompt will return you to the main menu.

It is a good idea at this point to use Option 2 and save the data to RAM. If the addresses are likely to be needed in the future, it is an easy matter to save the text file which is created to tape using the standard procedures outlined in your owner's manual.

After you have saved your data, it is time to use Option 4 to choose your addresses, set your printing parameters and print your labels.

Upon selecting, you will find a list of the first lines of entries one through five and a single line submenu indicating "Select, Continue and Return." This menu operates by your keying in the first letter of the option you want to use. If you find the first line of the address you want listed on the screen, simply press S followed by the number preceding that line on the display. This will take you to a screen displaying the complete address as you entered it and the choice of going to the hard copy menu or returning to the selection screen.

If you press H, the program drops down to another menu with the following options: 1) Change Font, 2) one-up Labels, 3) two-up Labels, and 4) Return. If you simply want to print regular labels in the normal font, choose either Option 2 or 3 to correspond to the type of labels you are using and you will then see a prompt requesting the number of labels you wish printed. For two-up labels, enter an even number, and for one-up, any amount. Press ENTER and, if your printer is online and your labels properly aligned, just relax and wait a bit. You should have your labels in a short period of time.

If you decide at the last menu that you wish to either print larger labels or you want a different print style, select Option 1, Change Font. This gives you the choices 1) Label or 2) Stencil. If you choose stencil, you simply have to answer the prompt requesting how many labels you want. If you choose label, you will be offered the following choices: 1) Normal, 2) Bold, 3) Condensed, 4) Compressed and 5) Elongated. Selecting one of these returns you to the hard copy routine menu at which point you choose one-up or two-up labels. Then indicate how many you want and, once again, you should be in the label generating business.

At this point I would like to go back and fill in a few details about how the selection routine works. Pressing C (for continue) will either drop to the next selection screen of five items or the Hardcopy/Return screen with the first address being displayed. Pressing R (for return) at this point will bring you back to the first selection screen, but pressing R in any of the selection screens will return you to the main menu.

Essentially, that is how the program works. It shouldn't take long to get the hang of it. I'd recommend running through the menus and getting the feel for how it works before powering up your printer, and then testing it with plain paper to see the hard copy results before using actual labels.

(Roger F. Krueger works in the field of materials handling in Dansville, N.Y. He has a bachelor's degree in English and is a self-taught BASIC programmer.)

Although I primarily use this program at home, it may come in handy for anyone who works in a shipping department where multiple labels are frequently used. Perhaps, if you work at a plant where it is a common practice to ship five or more packages to the same address, it could save a shipping clerk a lot of extra typing.

In any event, I have found that it is a definite cure for two well-known syndromes — writer's cramp and "chicken scratchitis." Well, I think I'd best get back to work on that other program which is kicking around in the back of my head. In the meantime, I hope this one works for you, and happy Model 100/200 computing. □

PCM BAR CODED LISTING

The listing:

```
3Ø GOSUB 5ØØØØ
5Ø ' TAG'R
6Ø ' by Roger F. Krueger
7Ø '    62 ELIZABETH STREET
8Ø '    DANSVILLE, NY 14437
9Ø '    (716) 335-5611
95 '
97 ' AUGUST 18, 1985
98 '
1ØØ CLEAR 2ØØØ
11Ø DIM A1$(2Ø),A2$(2Ø),A3$(2Ø),A4$(2Ø),
A5$(2Ø)
1ØØØ CLS
1Ø2Ø PRINT@5Ø,"### Label Menu ###"
1Ø3Ø SOUND 18ØØ,1Ø
1Ø4Ø PRINT@124,"1. Enter Data     2. Sav
e to RAM"
1Ø6Ø PRINT@164,"3. Load from RAM  4. Sel
ect"
1Ø8Ø PRINT@2Ø4,"5. Quit"
1Ø9Ø PRINT@29Ø,"Select [1-5]"
11ØØ K$=INKEY$:IF K$="" THEN 11ØØ
111Ø IFVAL(K$)<1 OR VAL(K$)>8 THEN 1ØØØ
112Ø ON VAL(K$) GOSUB 2ØØØ,3ØØØ,5ØØØ,54Ø
Ø,9ØØØ
115Ø GOTO 1ØØØ
1199 ' DATA ENTRY ROUTINE
2ØØØ CLS
2ØØ5 Y=1
2Ø1Ø PRINT"    Press <Enter> when finish
ed."
2Ø5Ø LINEINPUT" Line 1: ";A1$(Y)
2Ø55 IF A1$(Y)="" THEN RETURN
2Ø6Ø LINEINPUT" Line 2: ";A2$(Y)
2Ø7Ø LINEINPUT" Line 3: ";A3$(Y)
2Ø8Ø LINEINPUT" Line 4: ";A4$(Y)
2Ø9Ø LINEINPUT" Line 5: ";A5$(Y)
2Ø92 LINEINPUT" Is entry correct (Y/N)?"
;A$
2Ø93 IF A$="N" OR A$="n" THEN 2Ø1Ø ELSE
2Ø95
2Ø95 Y=Y+1
214Ø GOTO 2Ø5Ø
2999 ' RAM SAVE ROUTINE
3ØØØ CLS
3Ø1Ø PRINT@2Ø7,"Filename:  ";:LINEINPUT
NN$
3Ø3Ø OPEN NN$ FOR OUTPUT AS 1
3Ø4Ø FOR X=1 TO Y-1
3Ø5Ø PRINT#1,A1$(X):PRINT#1,A2$(X):PRINT
#1,A3$(X):PRINT#1,A4$(X):PRINT#1,A5$(X)
3Ø6Ø NEXTX
3Ø7Ø CLOSE:RETURN
4999 ' RAM LOAD ROUTINE
5ØØØ CLS
5Ø2Ø BEEP:PRINT@2Ø7,"Filename:  ";:LINEI
NPUT NN$
5Ø4Ø OPEN NN$ FOR INPUT AS 1
5Ø45 Y=1
5Ø5Ø IF EOF(1) GOTO 52ØØ
5Ø6Ø LINEINPUT#1,A1$(Y)
5Ø7Ø LINEINPUT#1,A2$(Y)
5Ø8Ø LINEINPUT#1,A3$(Y)
5Ø9Ø LINEINPUT#1,A4$(Y)
51ØØ LINEINPUT#1,A5$(Y)
512Ø Y=Y+1
513Ø GOTO 5Ø5Ø
52ØØ CLOSE
5399 ' SELECTION ROUTINE
54ØØ CLS:FOR X=1 TO Y-1 STEP 5
54Ø5 FOR K= X TO X+4
541Ø PRINTK;:PRINTA1$(K)
542Ø NEXT K
544Ø PRINT@24Ø,"Select   Continue   Retu
rn:   "
5442 K$=INKEY$:IF K$="" THEN 5442
545Ø IF K$="S" OR K$="s" THEN 547Ø
546Ø IF K$="R" OR K$="r" THEN 1ØØØ
5465 IF K$="C" OR K$="c" THEN 548Ø
547Ø PRINT@28Ø,"Enter Selection #:  ";:I
NPUT L:GOTO 567Ø
548Ø CLS:NEXT X
5485 GOTO 567Ø
55ØØ RETURN
567Ø CLS
569Ø PRINT A1$(L)
57ØØ PRINT A2$(L)
571Ø PRINT A3$(L)
572Ø PRINT A4$(L)
573Ø PRINT A5$(L)
575Ø PRINT@242,"  Hardcopy  Return"
576Ø K$=INKEY$:IF K$="" THEN 576Ø
577Ø IF K$="H" OR K$="h" THEN 2ØØØØ
578Ø IF K$="R" OR K$="r" THEN 54ØØ
8999 ' END PROGRAM
9ØØØ END
9999 ' STENCIL-LABEL OPTION
1ØØØØ CLS:PRINT@45,"1. Label"
1ØØ2Ø PRINT@85,"2. Stencil"
1ØØ4Ø K$=INKEY$:IF K$="" THEN 1ØØ4Ø
```

Text processing power that no other program can equal.

PCSG says "Send it back in 30 days for a full refund if you don't agree."

on Snap-in™ Cartridge $99.

WriteROM©

WRITE ROM is the definitive word processing extension for the Model 100. PCSG the first text formatter for the Model 100, now sold by Radio Shack as Scripsit 100: Now 18 months later PSCG introduces WRITE ROM. Those who have experienced it say WRITE ROM literally doubles the power of the Model 100.

First of all, WRITE ROM as its name implies is on a snap-in ROM. You simply take a quarter and open the little compartment on the back of the Model 100 and press it in. It is as easy as an Atari game cartridge. You can use other ROM programs like Lucid whenever you wish.

WRITE ROM lets you do every formatting function you would expect like setting margins, centering, right justifying and having headers and footers. But it does them under function key control.

WRITE ROM remembers your favorite format settings so that you can print a document without any setup, but you can change any formatting or printing parameters instantly with a function key.

WRITE ROM's "pixel mapping" feature shows you an instant picture on the screen of how your printout will look on paper.

In all there are 64 separate features and functions that you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formated or not) to any other computer over the phone with just a function key. What's more it dials and handles sign on and sign off protocol automatically.

Third, WRITE ROM has a wonderful feature called Library that lets you record favorite phrases, words or commonly used expressions (often called boilerplate).

Any place you wish any Library text to appear you just type a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer.

Picture what you can do with that kind of capability.

WRITE ROM is blindingly fast. No one can claim faster operation. Because it is on ROM it uses virtually none of your precious RAM. It works with any printer, serial or parallel. You can make a duplicate copy of a document file under a new filename. Rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of the amazingly powerful piece of software. Dot commands allow control of such things as margins, centering, line spacing and other changes in the middle of a document. Most are Wordstar compatible.

A mail merge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature like superscripts that your printer supports in a way that many users say "is worth the price of the program."

To underline you don't have to remember a complicated printer code. You just type CODE U, and to stop underline, CODE U again. The CODE key is to the right of your spacebar. Boldface? CODE B to start and stop. Easy to remember and do. Five different printer features of your choice.

We couldn't list all the features here. For example, not just double space but triple or any other. You can use your TAB key in a document. WRITE ROM allows you to indent. This means you can have paragraphs that have a first line projecting to the left of the rest of the paragraph. Plus many more features.

WRITE ROM has a feature unique to any word processor on any computer. It is called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionaires.

With FORM anyplace where you had previously typed a GRAPH T and a prompt in a document, WRITE ROM will stop and you are shown that prompt on the screen. You can type in directly on the screen and when you press F8 you see the next prompt. Goes to a printer or a RAM file.

Think of how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could have his entire questionaire. You could construct a series of prompts to answer correspondence typing the answers, even using Library codes. This feature lets you answer letters in rapid fire fashion each with personalized or standard responses.

Before WRITE ROM you had to be a programmer to create a series of prompts. Now its as simple as GRAPH T.

PCSG makes the claim that WRITE ROM is the easiest, fastest and most feature rich formatter for the Model 100. We are happy to offer WRITE ROM because it expands the 100 to a dimension of text processing you cannot equal on even larger computers.

We brashly state that WRITE ROM is the best you can buy. But put that to the test. If you aren't as excited as we are return it for a full refund. Priced at $99 on snap-in ROM. MasterCard, VISA, American Express and COD.

1-214-351-0564

PORTABLE COMPUTER SUPPORT GROUP

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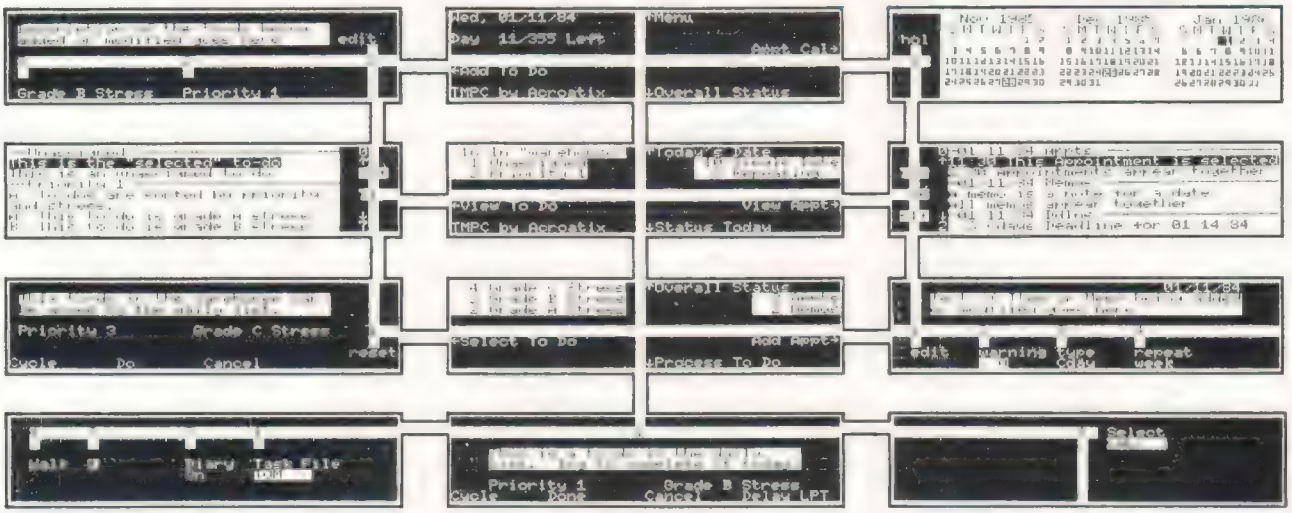
PCSG provides hotline software support for the Model 100 Call us at 1-214-351-0564

```
1005Ø ON VAL(K$) GOSUB 1Ø1ØØ,12ØØØ
1Ø1ØØ CLS:PRINT@1Ø,"** Choose Font **"
1Ø12Ø PRINT
1Ø13Ø PRINT"     1. Normal"
1Ø14Ø PRINT"     2. Bold"
1Ø15Ø PRINT"     3. Condensed"
1Ø16Ø PRINT"     4. Compressed"
1Ø17Ø PRINT"     5. Elongated"
1Ø18Ø PRINT"          Select (1-5)"
1Ø2ØØ K$=INKEY$:IF K$="" THEN 1Ø2ØØ
1Ø21Ø ON VAL(K$) GOSUB 1Ø29Ø,1Ø34Ø,1Ø39Ø
,1Ø44Ø,1Ø49Ø
1Ø22Ø GOTO 2ØØØØ
1Ø29Ø GOSUB 3ØØØØ
1Ø3ØØ LPRINTCHR$(27);CHR$(19)
1Ø32Ø RETURN
1Ø34Ø GOSUB 3ØØØØ
1Ø35Ø LPRINT CHR$(27);CHR$(31)
1Ø36Ø RETURN
1Ø39Ø GOSUB 3ØØØØ
1Ø4ØØ LPRINT CHR$(27);CHR$(2Ø)
1Ø42Ø RETURN
1Ø44Ø GOSUB 3ØØØØ
1Ø45Ø LPRINT CHR$(27);CHR$(21)
1Ø46Ø RETURN
1Ø49Ø GOSUB 3ØØØØ
1Ø5ØØ LPRINT CHR$(27);CHR$(14)
1Ø51Ø RETURN
11999 ' Stencil Print routine
12ØØØ CLS
12Ø2Ø LPRINT CHR$(27);CHR$(32): LPRINT C
HR$(27);CHR$(14)
12Ø3Ø PRINT:INPUT"How many labels do you
 wish ";J
12Ø4Ø FOR I=1 TO J
12Ø45 FOR X=1 TO 4:LPRINT:NEXT X
12Ø5Ø LPRINTTAB(1);A1$(L)
12Ø6Ø LPRINT
12Ø7Ø LPRINTTAB(1);A2$(L)
12Ø8Ø LPRINT
12Ø9Ø LPRINTTAB(1);A3$(L)
121ØØ LPRINT
1211Ø LPRINTTAB(1);A4$(L)
1212Ø LPRINT
1213Ø LPRINTTAB(1);A5$(L)
1214Ø FOR X=1 TO 5:LPRINT:NEXT X
1215Ø NEXT I
12155 LPRINT CHR$(27);CHR$(15):LPRINT CH
R$(27);CHR$(19)
1216Ø GOTO 54ØØ
2ØØØØ CLS
2ØØ1Ø PRINT"    *** Hardcopy Routine ***
"
2ØØ2Ø PRINT
2ØØ21 PRINT"  1. Change Font"
2ØØ25 PRINT"  2. 1-Up Labels"
2ØØ28 PRINT"  3. 2-Up Labels"
2ØØ29 PRINT"  4. Return"
2ØØ3Ø K$=INKEY$:IF K$="" THEN 2ØØ3Ø
2ØØ32 ON VAL(K$) GOSUB 1ØØØØ, 2ØØ4Ø,2Ø3Ø
Ø,2Ø6ØØ
2ØØ35 GOTO 2ØØØØ
2ØØ39 ' 1-UP LABELS
2ØØ4Ø PRINT:INPUT" How many labels do yo
u wish ";J
2ØØ6Ø FORI =1 TO J
2ØØ7Ø LPRINTTAB(1);A1$(L)
2ØØ75 LPRINTTAB(1);A2$(L)
2ØØ8Ø LPRINTTAB(1);A3$(L)
2Ø1ØØ LPRINTTAB(1);A4$(L)
2Ø11Ø LPRINTTAB(1);A5$(L)
2Ø115 LPRINT
2Ø12Ø NEXTI
2Ø13Ø GOTO 54ØØ
2Ø299 ' 2-UP LABELS
2Ø3ØØ PRINT:INPUT" How many labels do yo
u wish";J
2Ø32Ø FOR I=1 TO J/2
2Ø33Ø LPRINTTAB(1);A1$(L);:LPRINTTAB(41)
;A1$(L)
2Ø34Ø LPRINTTAB(1);A2$(L);:LPRINTTAB(41)
;A2$(L)
2Ø35Ø LPRINTTAB(1);A3$(L);:LPRINTTAB(41)
;A3$(L)
2Ø36Ø LPRINTTAB(1);A4$(L);:LPRINTTAB(41)
;A4$(L)
2Ø37Ø LPRINTTAB(1);A5$(L);:LPRINTTAB(41)
;A5$(L)
2Ø38Ø LPRINT
2Ø39Ø NEXT I
2Ø4ØØ GOTO 54ØØ
2Ø6ØØ GOTO 1ØØØ
29999 ' Reset Printer Control Codes
3ØØØØ CLS
3ØØ1Ø LPRINT CHR$(27);CHR$(15):LPRINT CH
R$(27);CHR$(32):LPRINT CHR$(27);CHR$(19)
3ØØ2Ø RETURN
5ØØØØ ' title screen
5ØØ2Ø CLS
5ØØ4Ø LINE(5,5)-(234,58),1,B
5ØØ6Ø LINE(5Ø,1Ø)-(19Ø,53),1,BF
5ØØ8Ø PRINT@135," TAG'R  "
5Ø1ØØ PRINT@17Ø," PROGRAM "
5Ø11Ø PRINT@185," *** "
5Ø12Ø FOR X=1 TO 1ØØØ:NEXT X
5Ø2ØØ SOUND18ØØ,1Ø:SOUND2Ø9Ø,1Ø:SOUND156
Ø,1Ø
5Ø22Ø CLS
5Ø24Ø LINE(5,5)-(234,58),1,B
5Ø26Ø LINE(5Ø,15)-(19Ø,48),1,BF
5Ø28Ø LINE(55,2Ø)-(185,43),Ø,B
5Ø3ØØ PRINT@128," Presented by "
5Ø32Ø PRINT@171,"    Roger F. Krueger
  "
5Ø34Ø SOUND156Ø,1Ø:SOUND2Ø9Ø,1Ø:SOUND18Ø
Ø,1Ø
5Ø36Ø FOR T=1 TO 1ØØØ:NEXT T
5Ø4ØØ RETURN
```

PCM

TMPC

A Plan for Efficiency



For the TRS-80 Model 100

More than a Calendar

TMPC helps you organize your day. It is more than a calendar program; it is a toolbox to help you keep your most urgent tasks at top priority.

Efficiency is no Game

When you use TMPC, you enter the system of screens and corridors shown above and access features by moving through the rooms with the arrow keys. The screens may resemble an adventure game, but TMPC is a serious tool. The user interface will become second nature to you, like walking through the rooms in your home.

Functions for Efficiency

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TYPING

What a day! I'm free at last to spend some time playing (make that working) with my Tandy 1000. Here's the latest issue of PCM with that "incredible, does-everything-known-to-mankind" program, mine for the typing. Now, let's see:

```
10 FOR X=1 to 2000
```

Now, where is that 'X' key today? Yesterday, it was somewhere down here in the bottom row. Forget it! I'll be two years typing this one in at this rate.

If this sounds familiar to you, or if you can think of somebody else who might benefit from increased typing skills, then *TYPING 1000* might just be for you. Typing is a skill which is a valuable tool to use throughout life, and adds much to the enjoyment of computing as a hobby. Like swimming, typing ability, once mastered, is not forgotten.

I have tried to keep the screen format of *TYPING 1000* attractive and at the same time easy to work on. Tandy BASIC is extremely cooperative in this effort, with its variety of screen displays aiding me to this end.

When the program is first presented, a title screen is displayed along with the author's name. When the title clears, we are ready to get down to business. A simulation of the Tandy keyboard is kept on the screen at all times (less numeric key pad). This enables the student to keep his eyes on the screen and not on the keyboard.

Student typists select from four different exercises of an on-screen explanation of the program goals and features. My suggestion is to stay with Selection 1 (Beginner), until you become comfortable with the idea of leaving your fingers on the "home keys" (highlighted on screen in red).

Learning to type is a rewarding experience in its own right and no scores or levels are required to make you feel good. In addition, I have not empasized speed typing. If you don't know where the keys are, it doesn't matter whether you are fast or slow. Learn the keyboard and the speed will come along by itself. One thing which cannot be over emphasized is this: "Keep your eyes on the screen display, not on the keyboard."

TYPING 1000 does not employ any mind-warping tricks in programming. The style is rather straightforward and

1000

By Leonard Hyre

simple and the average programmer will have no difficulty following program flow. The first action in the program is to dimension needed string space in Line 120. From there we jump into the title screen, making use of the often neglected Screen 3 to display large letters for the *TYPING 1000* banner.

The subroutine at Line 1410 draws the keyboard display using CHR$ to create a reasonable likeness of the original. Please note that while this section has little to do with program operation, it is important to carefully check your work here as an error will give your program the look of an ASCII omelet.

Users are then presented a menu offering a selection which will determine where the program goes from here. The INKEY$ is used to get the user selection, which then is converted to a VAL$ numeric. This prevents the student from accidently messing up the screen by an errant input.

Menu selections one and two share the same subroutines, only using different data for exercises. This routine utilizes Line 410 to call the subroutine at 1110 where the actual control is done. You should remember to press the ENTER key after each exercise is typed in. When a typist completes an exercise correctly four times, he or she hears a "shave and a haircut" and receives a new exercise. (I decided to add a little "pizzazz" to the program.)

Exercise three is a "word practice" format, being handled by lines 490-650. The Selection four gives you a series of "Phrases and Sentences" and is controlled by a separate subroutine in lines

---

(Leonard Hyre works as a claims representative for the Social Security Administration. He has written several articles for THE RAINBOW, PCM's sister publication for the Color Computer, and is the author of a number of commercial programs. He may be contacted at P.O. Box 403, Cambridge, MD 21613; 301-228-0064.)

690-830. Successful completion of 24 phrases leads to graduation of the student.

If you wish to add or change exercises, it is a simple matter to do. Change or add information in the DATA statements (lines 1850-1920) as you wish, remembering to also change the READ in Line 1850. Also, if exercises are added, the DIM in Line 120 must be modified.

TYPING 1000 is a long program, but one which you may find of some value in your software collection. If you are overwhelmed at the thought of typing in such a long program, send me $7 and a note requesting the program, and I'll send you a copy on disk. My address is L. Hyre, P.O. Box 403, Cambridge, MD 21613. If you encounter problems with the program, feel free to call me at (301) 228-0064 after 5: p.m. □

The listing:

```
1Ø '*************************************
2Ø '*                                   *
3Ø '*          TYPING  - 1ØØØ           *
4Ø '*         by Leonard  Hyre          *
5Ø '*   PO Bx 4Ø3 Cambridge MD 21613    *
6Ø '*                                   *
7Ø '*         1-3Ø1-228-ØØ64            *
8Ø '*    For TANDY MS-DOS Machines      *
9Ø '*************************************
91 '
95 ' *** SET UP HOUSEKEEPING AND TITLE SCREEN ***
96 '
1ØØ DEFINT A-Z
11Ø '
12Ø DIM A$(36),B$(36),C$(18),D$(12)
13Ø '
14Ø ' *** THE TITLE SCREEN ***
15Ø '
16Ø SCREEN 3,Ø:KEY OFF:COLOR 13,Ø
17Ø LOCATE 2,1:PRINT CHR$(2Ø1);STRING$(18,2Ø5);CHR$(187)
18Ø FOR X=3 TO 8:LOCATE X,1:PRINT CHR$(186):LOCATE X,2Ø:PRINT CHR$(186):NEXT
19Ø PRINT CHR$(2ØØ);STRING$(18,2Ø5);CHR$(188)
2ØØ COLOR 14
21Ø LOCATE 5,5:PRINT"TYPING..1ØØØ";:COLOR 11
22Ø LOCATE 14,5:PRINT"By"
23Ø NM$="Leonard Hyre":P=1:FOR LT=5 TO 18:LOCATE 16,LT:PRINT MID$(NM$,P,1):P=P+1
:PLAY"O1V15L64T125CP64P64":NEXT LT
24Ø FOR DL=1 TO 15ØØ:NEXT
```


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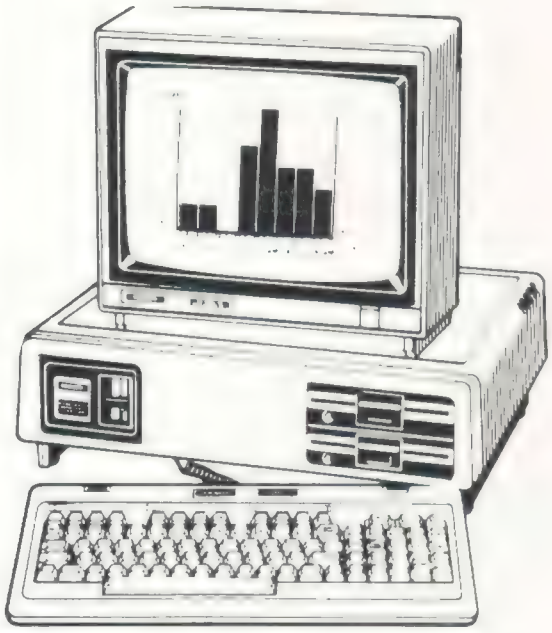

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```
25Ø GOSUB 185Ø
26Ø SCREEN Ø,Ø:KEY OFF:WIDTH 8Ø:COLOR 14,Ø:CLS
27Ø GOSUB 141Ø
28Ø LOCATE 13,1:COLOR 15:PRINT STRING$(8Ø,"*");
29Ø GOSUB 18ØØ
3ØØ '
31Ø '*** MENU DISPLAY ***
32Ø '
33Ø LOCATE 1,36,1,6,7:COLOR 14:PRINT"The MENU-";
34Ø LOCATE 2,36:PRINT"^^^^^^^^^^"
35Ø LOCATE 4,3Ø:PRINT"1> Beginner Exercises":LOCATE 5,3Ø:PRINT"2> Advanced Excer
cises":LOCATE 6,3Ø:PRINT"3> Word Practice":LOCATE 7,3Ø:PRINT"4> Full Phrases and
 Sentences":LOCATE 8,3Ø:PRINT"5> Instructions/Background
36Ø LOCATE 1Ø,3Ø:PRINT"Enter NUMBER of Choice?";
37Ø CH$=INKEY$:IF CH$="" THEN 37Ø
38Ø IF VAL(CH$)<1 OR VAL(CH$)>5 THEN 37Ø
39Ø GOSUB 18ØØ
4ØØ ON VAL(CH$) GOTO 44Ø,44Ø,49Ø,69Ø,87Ø
41Ø '
42Ø '*** THIS ROUTINE CALLS SUB SHARED BY SELECTIONS 1 AND 2
43Ø '
44Ø FOR E=1 TO 36:GOSUB 111Ø:NEXT
45Ø GOTO 29Ø
46Ø '
47Ø '*** ROUTINE FOR SELECTION 3 ***
48Ø '
49Ø COLOR 13:LOCATE 1,1:PRINT"WORD PRACTICE....":LOCATE 1,6Ø:COLOR 4:PRINT"'?'at
```


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```
 prompt = MENU.":COLOR 7:PRINT STRING$(8Ø,239);
5ØØ LOCATE 5,66:COLOR 1Ø:PRINT"DON'T WORRY":LOCATE 6,66:PRINT"ABOUT SPEED"
51Ø LOCATE 1Ø,7:COLOR 14,1:PRINT"   Repeat These Word Exercises Until You Can Ty
pe Them Smoothly.    ":COLOR 11,Ø
52Ø FOR E=1 TO 18
53Ø COLOR 11:LOCATE 4,1:PRINT"Here is your word....";C$(E)
54Ø LOCATE 5,12:PRINT"TYPE....";
55Ø INPUT AN$
56Ø IF AN$=CHR$(&H3F) THEN GOTO 29Ø
57Ø IF AN$<>C$(E) THEN LOCATE 6,37:COLOR 13:PRINT"ERROR!":BEEP:FOR DL=1 TO 2ØØ:N
EXT:LOCATE 6,37:PRINT SPACE$(6):COLOR 6
58Ø LOCATE 4,22:PRINT SPACE$(12):LOCATE 5,12:PRINT SPACE$(2Ø)
59Ø FOR DL=1 TO 1ØØØ:NEXT:PLAY"O5C"
6ØØ NEXT E
61Ø LOCATE 7,1:COLOR 15:PRINT"Choose: <R>edo words       <M>enu"
62Ø AX$=INKEY$:IF AX$=""THEN 62Ø
63Ø LOCATE 7,1:PRINT SPACE$(6Ø):BEEP
64Ø IF AX$="r" OR AX$="R" THEN 49Ø
65Ø IF AX$<>"r"OR AX$<>"R"THEN 29Ø
66Ø '
67Ø '*** ROUTINE FOR SELECTION 4 - PHRASES AND SENTENCES ***
68Ø '
69Ø LOCATE 1,1:COLOR 11:PRINT"PHRASE and SENTENCE ACCURACY....":COLOR 15:LOCATE
1,6Ø:PRINT"'?'at prompt = MENU":TC=Ø:COLOR 14
7ØØ PRINT STRING$(8Ø,239)
71Ø LOCATE 1Ø,3Ø:COLOR 2:PRINT"24 CORRECT REQUIRED";:COLOR 3:LOCATE 11,34:PRINT"
Correct=";:COLOR 6:PRINT TC;
72Ø FOR E=1 TO 12
73Ø LOCATE 4,1:COLOR 1Ø:PRINT"YOUR PHRASE IS.....";:COLOR 15:PRINT D$(E)
74Ø LOCATE 5,66:COLOR 1Ø:PRINT"DON'T WORRY"
75Ø LOCATE 6,66:PRINT"ABOUT SPEED"
76Ø LOCATE 5,1Ø:COLOR 14:PRINT"TYPE....";:INPUT AN$
77Ø IF AN$=CHR$(&H3F) THEN 29Ø
78Ø IF AN$=D$(E) THEN TC=TC+1:GOSUB 196Ø:IF TC=24 THEN 131Ø ELSE 8ØØ
79Ø LOCATE 6,37:COLOR 12:PRINT"ERROR!":BEEP:FOR DL=1 TO 28Ø:NEXT:LOCATE 6,37:PRI
NT SPACE$(6):COLOR 14
8ØØ LOCATE 4,1:PRINT SPACE$(6Ø):LOCATE 5,1:PRINT SPACE$(6Ø)
81Ø LOCATE 11,42:COLOR 12:PRINT TC
82Ø NEXT E
83Ø IF TC<24 THEN 72Ø
84Ø '
85Ø '*** ROUTINE FOR SELECTION 5 - INSTRUCTIONS AND BACKGROUND ***
86Ø '
87Ø LOCATE 1,1:COLOR 3:PRINT"INSTRUCTIONS and BACKGROUND....."
88Ø LOCATE 2,1:COLOR 15:PRINT STRING$(8Ø,239);
89Ø LOCATE 3,4:COLOR 9:PRINT"This program is designed to give you a number of ba
sic exercises to get you  started on the way to becoming a capable typist.";
9ØØ PRINT"The emphasis is on accuracy,  rather than speed. The speed should come
 naturallywith time."
91Ø COLOR 15:LOCATE 7,28:PRINT"**********************************":LOCATE 8,28:P
RINT"*    FOLLOW THESE GUIDELINES:     *"
92Ø LOCATE 9,28:PRINT"*  1> Keep fingers on HOME keys  *"
93Ø LOCATE 1Ø,28:PRINT"*  2> Start at BEGINNER  series  *"
94Ø LOCATE 11,28:PRINT"*  3> Keep eyes on the 'SCREEN'  *"
95Ø LOCATE 12,28:PRINT"**********************************"
96Ø LOCATE 12,1:COLOR 2:PRINT"PRESS ANY KEY....";
97Ø AK$=INKEY$:IF AK$=""THEN 97Ø
98Ø FOR SW=3 TO 12:LOCATE SW,1:PRINT STRING$(8Ø," ");::NEXT SW
```

```
99Ø COLOR 13:LOCATE 3,1:PRINT"There are several features that should be noted by
 the new user."
1ØØØ COLOR 2:PRINT"     1> On Screen Keyboard Layout For Reference."
1Ø1Ø PRINT"        A. Home Keys Are Highlighted In ";:COLOR 12,8:PRINT"RED.":COL
OR 2,Ø
1Ø2Ø PRINT"        B. Caps Lock Key Is Shown 'ON' As Reminder."
1Ø3Ø PRINT"     2> At Any Prompt You May Type '?' To Return To Main Menu."
1Ø4Ø PRINT"     3> There Is No Formal Lesson Plan. Work at your own pace."
1Ø5Ø COLOR 2:LOCATE 11,1:PRINT"PRESS ANY KEY TO CONTINUE...."
1Ø6Ø AK$=INKEY$:IF AK$=""THEN 1Ø6Ø
1Ø7Ø GOTO 29Ø
1Ø8Ø '
1Ø9Ø '*** BODY OF ROUTINE FOR SELECTIONS 1 AND 2 ***
11ØØ '
111Ø TI=Ø:COLOR 3:LOCATE 1,1:IF VAL(CH$)=1 THEN PRINT"BEGINNERS EXERCISES...."EL
SE PRINT"ADVANCED EXERCISES...."

112Ø LOCATE 1,6Ø:COLOR 15:PRINT"'?' at prompt = MENU.":COLOR 12:PRINT STRING$(8Ø
,239);
113Ø LOCATE 4,1:COLOR 14:PRINT"HERE IS YOUR EXERCISE...."
114Ø LOCATE 1Ø,23:COLOR 1Ø:PRINT"Type Each Exercise Correctly 4 Times."
115Ø IF VAL(CH$)=1 THEN LOCATE 4,26:PRINT CHR$(&HDD)+A$(E)+CHR$(&HDE)
116Ø IF VAL(CH$)=2 THEN LOCATE 4,26:PRINT CHR$(&HDD)+B$(E)+CHR$(&HDE)
117Ø LOCATE 4,62:PRINT"TIMES PERFECT: ";TI
118Ø LOCATE 5,17:PRINT"TYPE....";:INPUT AN$
119Ø IF AN$=CHR$(&H3F) THEN GOTO 29Ø
12ØØ IF VAL(CH$)=1 AND AN$=A$(E) THEN TI=TI+1 ELSE IF VAL(CH$)=2 AND AN$=B$(E) T
HEN TI=TI+1
121Ø IF AN$=A$(E) OR AN$=B$(E) THEN LOCATE 4,77:PRINT TI;:PLAY"O5C"
122Ø IF VAL(CH$)=1 AND AN$<>A$(E) THEN LOCATE 6,37:COLOR 12:PRINT"ERROR!":PLAY"O
1V15C":FOR DL=1 TO 3ØØ:NEXT:LOCATE 6,37:PRINT SPACE$(6):COLOR 1Ø
123Ø IF VAL(CH$)=2 AND AN$<>B$(E) THEN LOCATE 6,37:COLOR 4:PRINT"ERROR!":BEEP:FO
R DL=1 TO 2ØØ:NEXT:LOCATE 6,37:PRINT SPACE$(6):COLOR 6
124Ø LOCATE 5,17:PRINT SPACE$(2Ø);
125Ø IF TI< 4 THEN 118Ø
126Ø IF TI=4 THEN GOSUB 196Ø
127Ø RETURN
128Ø '
129Ø '*** GRADUATION AWARD ***
13ØØ '
131Ø GOSUB 196Ø:GOSUB 18ØØ
132Ø LOCATE 5,39:COLOR 4,6:PRINT"TYPING":LOCATE 6,39:PRINT"SCHOOL":COLOR Ø,6:LOC
ATE 7,38:PRINT"GRADUATE"
133Ø KEY OFF:SCREEN 3,1:COLOR 1,3:CLS:LOCATE 4,1
134Ø PRINT" CONGRATULATIONS!"
135Ø LOCATE 12,6:PRINT"You Have"
136Ø LOCATE 18,5:PRINT"Graduated!"
137Ø GOTO 137Ø
138Ø '
139Ø '*** DRAW THE ON SCREEN KEYBOARD DISPLAY ***
14ØØ '
141Ø LOCATE 14,1:COLOR Ø,7:FOR WIPE=14 TO 24:PRINT STRING$(8Ø," ");:NEXT:LOCATE
14,1
142Ø K1$=CHR$(2Ø1):K2$=CHR$(187):K3$=CHR$(2Ø3):K4$=CHR$(186):K5$=CHR$(2Ø6)
143Ø K6$=CHR$(2ØØ):K7$=CHR$(188):K8$=CHR$(2Ø5):K9$=CHR$(186)
144Ø K1Ø$=CHR$(2Ø4):K11$=CHR$(185):K12$=CHR$(2Ø2)
145Ø PRINT "            ";K1$;
146Ø FOR RP=1 TO 3:PRINT K8$;K8$;K8$;K3$;:NEXT RP:PRINT K8$;K8$;K8$;K2$;"   ";K1
```

```
$;
147Ø FOR RP=1 TO 3:PRINT K8$;K8$;K8$;K3$;:NEXT RP:PRINT K8$;K8$;K8$;K2$;"   ";K1
$;
148Ø FOR RP=1 TO 3:PRINT K8$;K8$;K8$;K3$;:NEXT RP:PRINT K8$;K8$;K8$;K2$;"   ";
149Ø PRINT" "
15ØØ PRINT "            ";
151Ø PRINT K9$;"F 1";K9$;"F 2";K9$;"F 3";K9$;"F 4";K9$;"   ";K9$;"F 5";K9$;"F 6"
;K9$;"F 7";K9$;"F 8";K9$;"   ";K9$;"F 9";K9$;"F1Ø";K9$;"F11";K9$;"F12";K9$
152Ø PRINT "            ";K1Ø$;:
153Ø PRINT K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K
8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K
8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K5$;K8$;K8$;K8$;K11$
154Ø PRINT "            ";
155Ø PRINT K9$;"esc";K9$;" 1 ";K9$;" 2 ";K9$;" 3 ";K9$;" 4 ";K9$;" 5 ";K9$;" 6 "
;K9$;" 7 ";K9$;" 8 ";K9$;" 9 ";K9$;" Ø ";K9$;" - ";K9$;" = ";K9$;"bak";K9$
156Ø PRINT "            ";K1Ø$;
157Ø PRINT K8$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K
3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K
12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;
K8$;K12$;K2$
158Ø PRINT "            ";
159Ø PRINT K9$;"TAB ";K9$;" Q ";K9$;" W ";K9$;" E ";K9$;" R ";K9$;" T ";K9$;" Y
";K9$;" U ";K9$;" I ";K9$;" O ";K9$;" P ";K9$;" [ ";K9$;" ] ";K9$;"   ";K9$
16ØØ PRINT "            ";K1Ø$;
161Ø PRINT K8$;K8$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K1
2$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K
8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K12$;K3$;K8$;K8$;K7$;"   "
;K4$
162Ø PRINT "            ";K9$;
163Ø PRINT "cntl ";K9$;" A ";K9$;" S ";K9$;" D ";K9$;" F ";K9$;" G ";K9$;" H ";K
9$;" J ";K9$;" K ";K9$;" L ";K9$;" ; ";K9$;" ' ";K9$;"enter ";K9$;
164Ø PRINT"            ";
165Ø PRINT K1Ø$;K8$;K8$;K8$;K3$;K8$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K
8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;
K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K3$;K12$;K8$;K8$;K8$;
K3$;K8$;K8$;
166Ø PRINT K11$
167Ø PRINT"            ";
168Ø PRINT K4$;"c";:COLOR 12:PRINT CHR$(219);:COLOR Ø:PRINT"p";K4$;"SHFT";K4$;"
Z ";K4$;" X ";K4$;" C ";K4$;" V ";K4$;" B ";K4$;" N ";K4$;" M ";K4$;" , ";K4$;"
. ";K4$;" / ";K4$;"SHFT";K4$;"<-";K4$
169Ø PRINT"            ";
17ØØ PRINT K6$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K12$;K8$;K8$;K8
$;K12$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K12$;K8$;K
8$;K8$;K12$;K8$;K8$;K8$;K12$;
171Ø PRINT K8$;K8$;K8$;K12$;K8$;K8$;K8$;K12$;K8$;K8$;K8$;K8$;K12$;K8$;K8$;K7$;
172Ø LT$="ASDF":P=1:COLOR 12
173Ø FOR LT=21 TO 33 STEP 4:LOCATE 21,LT:PRINT MID$(LT$,P,1):P=P+1:NEXT LT
174Ø LT$="JKL:":P=1:COLOR 12
175Ø FOR LT=45 TO 57 STEP 4:LOCATE 21,LT:PRINT MID$(LT$,P,1):P=P+1:NEXT LT
176Ø RETURN
177Ø '
178Ø '*** WIPE THE TOP HALF OF THE SCREEN CLEAN ***
179Ø '
18ØØ COLOR 14,Ø:FOR WIPE=1 TO 12:LOCATE WIPE,1:PRINT SPACE$(8Ø);:NEXT
181Ø RETURN
182Ø '
183Ø '*** DATA FOR EXERCISES READ IN FROM HERE ***
```

```
184Ø '
185Ø FOR X=1 TO 36:READ A$(X):NEXT:FOR X=1 TO 36:READ B$(X):NEXT:FOR X=1 TO 18:R
EAD C$(X):NEXT:FOR X= 1 TO 12:READ D$(X):NEXT
186Ø DATA SFAD,FADS,KJL;,J;LK,GHTU,UGHT,WEVN,VEWQ,INOP,PINO,ZXTR,BRNY,CLOS,SEKP,
TYUI,REOP,MVWH,DALK,VBNC,ZXCV,DEKI,AIAI,SUEA,QWOI,KSDJ,FDSA,JKLO,QWTR,OICN,NOQZ,
HG;A,SLKD,YTOW,QOEI,ERLM,PSTR
187Ø DATA A1S2,D3F5,T4Y5,7K86,POQW,D3LØ,J5K1,Ø932,DØ12,PCB4,CR45,USAØ,ZØ21,MO3D,
LØO9,DR13,PR3V,ZPR6,NHU8,HØDX,XYP3,Ø1CE,NL9Ø,SLØ2,PØ3C,XØ9E,MOT5,9371,CØZ3,FHØ3,
DX34,NL9Ø,HNLZ,ZN37,CDE3,LKN8
188Ø DATA DOWNTOWN,EVERYDAY,ANTICIPATE,MERIDIAN,MAXIMUM,IMITATE,ZESTFUL,UNDERSTA
ND,OVERCOME
189Ø DATA MEANINGFUL,XYLOPHONE,SCHOOLING,PHOTOGRAPH,EXONERATE,INTERFACE,COMPUTER
,GREATEST,MAGAZINE
19ØØ DATA NOW IS THE TIME FOR ALL GOOD MEN,EVERY GOOD BOY WILL HAVE HIS DAY,THER
E IS NOTHING STOPPING ME NOW,ROSES ARE RED-VIOLETS ARE VIOLET,MANY A GOOD MAN HA
S GONE ASTRAY,I LOVE TO TYPE WITH MY OWN TANDY,THE SLY FOX WILL GET THE CHICKEN
191Ø DATA COMPUTERS ARE NOT ACTUALLY SMART,HE LIKES TO WRITE HIS OWN STORIES,OST
RICHES ARE VERY STRANGE BIRDS,PLUTO AND CHARON ARE FAR DISTANT,DANCING AND SINGI
NG CELEBRATIONS
192Ø RETURN
193Ø '
194Ø '*** MAKE EXTREMELY STRANGE NOISES AS REQUIRED ***
195Ø '
196Ø PLAY"T1ØØV15L16O3CO2P64L16GL32GP32AL16P32G":FOR DL=1 TO 35Ø:NEXT:PLAY"L16BP
32O3C"
197Ø RETURN
198Ø END
```

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A home improvement tool for your Tandy 1000

The Handi 1000

By Leonard Hyre

Why is it that everybody seems to have a neighbor whose favorite statement goes something like "so what does it do besides play games?" No use in bringing out *WordStar* or *1-2-3* for this guy — that would send him into future shock. This program, *The Handi 1000* might then be the answer. He or she will be able to readily grasp the conveniences offered by *The Handi 1000* as they apply to his everyday life. And of course, you also will benefit by having a handy set of home improvement tools available when you need them.

The program presented here does all the calculating of materials needed for a number of home improvement jobs and allows the user to make useful cost comparisons rather than jumping blindly into a job. Options include painting, wallpapering, carpeting, tiling, concrete pouring and paneling.

Tandy 1000 BASIC is a powerful version of Microsoft BASIC and offers us great flexibility in creating useful and attractive programs. I have made use of BASIC's SCREEN 6 by using a CLEAR ,,,(32768) statement to reserve the additional memory needed to make utilization of this graphics mode possible. By using SCREEN 6, we will be able to use 80-character text and high-resolution graphics statements on the same screen. This gives us the ability to draw graphics representations of the types of projects undertaken, making measurements, etc., easier to understand.

The LINE and PAINT commands are used often to draw the walls, floorplans, 3-D concrete pours and other graphics representations. These are simple to use and provide an easy way to dress up the screens for the various routines. Also, for those of you not familiar with the many variations of the powerful PRINT USING, you may find the printer option routines interesting to read over. This command allows us to to present attractive printout formats and still keep all of our command generic; the advantage being a program that does not need to be modified by the user.

From the main menu, you will be presented six options (as listed earlier). The basic screen format for the paneling and painting is shared as is the format for carpeting and tiling. Wallpapering and concrete pouring each get separate graphics treatments. In each case, the user is prompted for the information needed to complete the job estimate. Following the input of needed information, the program offers a hardcopy option.

I realize the listing is a long one, but I believe you will be pleased with the results. *The Handi 1000* can really be a useful program to have in your software collection. If the thought of typing it all in overwhelms you, just send me $8 to cover the cost of the disk and postage, your name and address and I'll be happy to send you a copy on disk. □

The listing:

```
100 '****************************************
110 '*          The...HANDI 1000            *
120 '*                by                    *
130 '*            Leonard Hyre              *
140 '*              (C) 1985                *
150 '****************************************
160 '
170 '80 COLUMN TEXT AND HI-RES GRAPHICS USING SCREEN 6
180 '
190 '
200 '*** SET UP SPACE FOR SCREEN 6 ***
210 '
220 CLEAR ,,,(32768!)
230 KEY OFF:SCREEN 6,1:COLOR 14,0:CLS
240 PALETTE 2,10
250 '
260 '*** SHOW THE MENU HERE ***
270 '
280 CLS:COLOR 14,0:GOSUB 1840:PRINT STRING$(80,"*"):LOCATE 3,29:PRINT"The.....H
A N D I - 1000":LOCATE 5,1:PRINT STRING$(80,"*")
290 FOR DL=1 TO 600:NEXT:LOCATE 8,36:PRINT"The MENU"
300 LOCATE 11,34:PRINT"1>  PANELING"
310 LOCATE 12,34:PRINT"2>  PAINTING"
320 LOCATE 13,34:PRINT"3>  WALLPAPER"
330 LOCATE 14,34:PRINT"4>  CARPETING"
340 LOCATE 15,34:PRINT"5>  CONCRETE"
350 LOCATE 16,34:PRINT"6>  TILES"
360 LINE(250,50)-(400,145),1,B:LINE(250,50)-(230,40),1:LINE-(230,135),1:LINE-(25
0,145),1:LINE(230,40)-(380,40),1:LINE-(400,50),1:PAINT(380,45),1,1
370 LINE(230,130)-(50,130),2:LINE-(100,160),2:LINE-(580,160),2:LINE-(520,130),2:
LINE-(400,130),2:LINE(100,162)-(580,178),2,B:PAINT(570,175),2,2
380 LOCATE 22,27:PRINT" HANDI 1000....by Leonard Hyre ";:LOCATE 25,1:PRINT"  CAP
S KEY ON!  ";:LINE(2,190)-(125,199),2,B
390 LINE(204,166)-(459,177),0,B
400 PLAY"O1C":LOCATE 18,38:PRINT "YOUR CHOICE?"
410 AN$=INKEY$
420 IF AN$=""THEN 410 ELSE LINE(2,190)-(125,199),0,BF
430 IF AN$="1"THEN S1$="PANELING"
440 IF AN$="2"THEN S1$="PAINTING"
450 '
460 '*** USE INSTR COMMAND TO GOTO THE PROPER SUBROUTINE ***
470 '                                                                  L
IST
480 ON INSTR("123456",AN$)GOTO 530,530,1060,1360,1890,1360
490 GOTO 410
500 '
510 ' *** PANELING AND PAINTING SETUP ***
520 '
530 COLOR 0,7:CLS:LINE(380,80)-(600,130),1,B:LINE(440,100)-(470,128),1,B:LINE(52
5,100)-(575,118),1,B:PAINT(382,82),2,1:PAINT(530,110),4,1:PAINT(442,102),4,1
540 XH$="HEIGHT":FOR LT=11 TO 17:LOCATE LT,45:PRINT MID$(XH$,LT-10,1);:NEXT LT
550 XH$="<- W I D T H ->":FOR LT=54 TO 69:LOCATE 19,LT:PRINT MID$(XH$,LT-53,1);:
NEXT LT
560 LOCATE 12,56:PRINT"DOOR":LOCATE 12,67:PRINT"WINDOW":LOCATE 1,1
570 GOSUB 1800:PRINT:PRINT STRING$(80,"*"):LOCATE 3,1:PRINT"The M E A S U R E M
E N T S--";:LOCATE 4,1:PRINT STRING$(80,"*");:
580 LOCATE 3,40:PRINT S1$
590 LOCATE 5,2:PRINT"HT OF WALL(FT/IN.)":INPUT" FT. ";HA$:GOSUB  1800:INPUT" IN"
```

```
;HB$:GOSUB  18ØØ
6ØØ PRINT" WIDTH A (FT/IN)":LINE INPUT" FT?";WF$:LINE INPUT" IN?";WI$:GOSUB  18Ø
Ø:INPUT" NO.OF WALLS THIS SIZE";AZ:GOSUB  18ØØ:PRINT" WIDTH B (FT/IN)":LINE INPU
T" FT?";WG$:LINE INPUT" IN?";WJ$:GOSUB  18ØØ:INPUT" NO.OF WALLS THIS SIZE";AX:GO
SUB  182Ø
61Ø INPUT" NO.OF REGULAR WINDOWS";WN:GOSUB  18ØØ
62Ø INPUT" NO.OF PICTURE WINDOWS";WP:GOSUB  18ØØ:OQ=WP
63Ø INPUT" NO.OF DOORS";DR:GOSUB  18ØØ
64Ø ZZ=VAL(HA$)*12+VAL(HB$)
65Ø ZY=VAL(WF$)*12+VAL(WI$)
66Ø ZX=VAL(WG$)*12+VAL(WJ$)
67Ø WA=WN*1152:WP=WN*23Ø6:DA=DR*198Ø:RE=WA+WP+DA
68Ø GOSUB  184Ø
69Ø GB=(ZZ*ZY)*AZ:GC=(ZZ*ZX)*AX
7ØØ GA=(GB+GC)-RE
71Ø NF=INT(GA/144):NI=GA-(NF*144)
72Ø IF AN$="1"THEN  73Ø  ELSE IF AN$="2"THEN 82Ø ELSE IF AN$="3"THEN 1Ø6Ø
73Ø PRINT STRING$(8Ø,"_");:PRINT" WHAT ROOM ARE WE WORKING WITH? ";
74Ø LINE INPUT RM$:IF RIGHT$(RM$,4)<>"ROOM" THEN RM$=RM$+" ROOM":GOSUB  18ØØ
75Ø NP=INT(NF/32)+1
76Ø PRINT" PANEL CALCULATIONS: ";
77Ø PRINT" TO DO THE ";:PRINT RM$;" YOU WILL NEED APPROXIMATLEY ":PRINT" A TOTAL
 OF ";:PRINT USING"###.#";NP;:PRINT" SHEETS OF PANEL."
78Ø PRINT" PRINT THIS (Y/N)";
79Ø LQ$=INKEY$:IF LQ$=""THEN 79Ø
8ØØ IF LQ$="Y" OR LQ$="y" THEN GOSUB  259Ø
81Ø RUN 28Ø
82Ø LOCATE 19,1:PRINT STRING$(8Ø,"_");:PRINT" PAINTING CALCULATIONS: ";
83Ø PRINT" WHAT ROOM ARE WE WORKING WITH? ";
84Ø LINE INPUT RM$:IF RIGHT$(RM$,4)<>"ROOM" THEN RM$=RM$+" ROOM":GOSUB  18ØØ
85Ø PRINT" COST OF PAINT/GALLON?$";:LINE INPUT CG$:GOSUB 18ØØ
86Ø LOCATE 21,4Ø:PRINT"     HOW MANY COATS WILL  YOU APPLY? ";:LINE INPUT NC$:GO
SUB 18ØØ
87Ø PRINT" HOW MANY SQ.FT/GAL.DOES MFG.RECOMEND?";:LINE INPUT FG$:GOSUB 18ØØ
88Ø LOCATE 23,2:PRINT"WILL YOU DO CEILING?(Y/N)":GOSUB 18ØØ
89Ø A$=INKEY$:IF A$=""THEN 89Ø
9ØØ IF A$ <>"Y" THEN 93Ø
91Ø NF=((ZY*ZX)/144)+NF
92Ø FOR DL= 1 TO 8ØØ:NEXT
93Ø FOR WIPE=2Ø TO 24:LOCATE WIPE,1:PRINT SPACE$(8Ø);:NEXT WIPE
94Ø LOCATE 2Ø,1:PRINT" PAINTING CALCULATIONS     "
95Ø PRINT" TO PAINT THE ";RM$;:PRINT" YOU WILL NEED ";:GN=INT(NF/VAL(FG$)*VAL(NC
$)+1):PRINT USING"###.#";GN;:PRINT" GALLONS."
96Ø PRINT" THE APPROXIMATE COST WILL  BE ";
97Ø CG=VAL(CG$):CP=GN*CG
98Ø PRINT USING"$###.##";CP
99Ø PRINT " PRINT THIS <Y/N>?"
1ØØØ OG$=INKEY$:IF OG$=""THEN 1ØØØ
1Ø1Ø IF OG$="Y" OR OG$="y"THEN GOSUB 267Ø
1Ø2Ø RUN 28Ø
1Ø3Ø '
1Ø4Ø '*** WALLPAPERING HERE ***
1Ø5Ø '
1Ø6Ø COLOR Ø,7:CLS:PRINT STRING$(8Ø,2Ø2):LOCATE 2,1:PRINT"WALLPAPER CALCULATION"
:LOCATE 3,1:PRINT STRING$(8Ø,2Ø2)
1Ø7Ø LINE(3Ø9,119)-(618,185),Ø,B
1Ø8Ø PPR$=STRING$(38,CHR$(1)):FOR PAPER=16 TO 23:LOCATE PAPER,4Ø:PRINT PPR$;:NEX
T PAPER
1Ø9Ø LINE(35Ø,13Ø)-(4ØØ,183),2,BF:LINE(48Ø,13Ø)-(55Ø,165),1,BF:LINE(5Ø5,13Ø)-(48
```

```
5,15Ø),Ø:LINE-(5Ø5,165),Ø:LINE(525,13Ø)-(545,15Ø),Ø:LINE-(525,165),Ø:PAINT(5ØØ,1
33),2,Ø:PAINT(53Ø,132),2,Ø:CIRCLE(39Ø,155),3
11ØØ HE$="HEIGHT":FOR LT=17 TO 22:LOCATE LT,38:PRINT MID$(HE$,LT-16,1):NEXT LT:L
OCATE 15,41:PRINT"<<-------      WIDTH      ------->>":LOCATE 8,46:PRINT"Sample
for Wallpapering"
111Ø LOCATE 5,1:  INPUT"WHAT ROOM ARE WE WORKING WITH ";RM$:IF RIGHT$(RM$,4)<>"R
OOM"THEN RM$=RM$+" ROOM":GOSUB 18ØØ
112Ø PRINT"MEASURE & RAISE  RESULT TO THE  NEXT WHOLE FOOT!
113Ø PRINT"NOTE:  WE WILL BE USING STANDARD 36 SQ.FT. ROLL   FOR CALCULATIONS WI
TH 6 SQ.FT FOR  PATTERN MATCH. ";
114Ø PRINT"ON OCCASION YOU MAY FIND DOUBLE LENGTH ROLLS OF 72 SQ.FT."
115Ø INPUT"WILL YOU BE USING THE'SINGLE' SIZE <Y/N>";SS$
116Ø INPUT"WIDTH WALL A";WA$:INPUT"NO.WALLS THIS SIZE";NW
117Ø INPUT"WIDTH WALL B";WB$:INPUT"NO.WALLS THIS SIZE";SB
118Ø TW=VAL(WA$)*NW+VAL(WB$)*SB
119Ø INPUT"HEIGHT OF WALLS";HW:INPUT"NO.OF WINDOWS";NZ:INPUT"NO.OF DOORS";ND
12ØØ RP=(TW*HW)/3Ø-(INT(NZ)/2+ND)+1:IF SS$="N"THEN RP=RP/2
121Ø RO=INT(RP)+1
122Ø INPUT"COST PER ROLL";CR
123Ø FOR XN=18 TO 22:LOCATE XN,1:PRINT SPACE$(36);:NEXT
124Ø LOCATE 18,1
125Ø PRINT"TO WALLPAPER THE ";RM$
126Ø PRINT" YOU NEED ";RO;" ROLLS"
127Ø PRINT:PRINT" YOUR COST IS ";
128Ø PRINT USING"$###.##";CR*RO
129Ø PRINT" PRINT THIS? <Y/N>"
13ØØ OG$=INKEY$:IF OG$=""THEN 13ØØ
131Ø IF OG$="Y" OR OG$="y" THEN GOSUB  275Ø
132Ø RUN 28Ø
133Ø '
134Ø '*** CARPETING THE ROOM AND LAYING TILES HERE ***
135Ø '
136Ø COLOR 15,1:CLS:PRINT STRING$(8Ø,"*"):IF AN$="4"THEN SY$="CARPETING A ROOM"
ELSE IF AN$="6"THEN SY$="* TILING A ROOM *"
137Ø LOCATE 2,32:PRINT SY$
138Ø LOCATE 3,1:PRINT STRING$(8Ø,"*");
139Ø LINE(36Ø,14Ø)-(62Ø,19Ø),3,B:PAINT(365,145),3,3:LINE(45Ø,14Ø)-(5ØØ,156),1,BF
:LINE(62Ø,16Ø)-(636,184),1,BF
14ØØ LINE(38Ø,138)-(43Ø,142),Ø,B:LINE(55Ø,138)-(6ØØ,142),Ø,B:LINE(358,15Ø)-(362,
17Ø),Ø,B
141Ø LOCATE 14,46:PRINT"TERMS TO UNDERSTAND:":LOCATE 15,46:PRINT"1-MAIN ROOM ARE
A":LOCATE 16,46:PRINT"2-CUT OUTS":LOCATE 17,46:PRINT"3-ADD ONS"
142Ø LOCATE 19,59:PRINT "<2>":LOCATE 22,79:PRINT"3":LOCATE 23,59:PRINT"<1>":LOCA
TE 12,55:PRINT" Sample Floor Plan";
143Ø LOCATE 6,2:PRINT"WHICH ROOM ARE WE WORKING WITH";:INPUT RM$:IF RIGHT$(RM$,4
)<>"ROOM"THEN RM$=RM$+" ROOM"
144Ø IF AN$="4"THEN PRINT" MEASURING FOR  CARPET: ";:ELSE IF AN$="6"THEN PRINT"
MEASURING FOR TILES: ";
145Ø IF AN$="4"THEN PRINT" USE NEAREST FOOT FOR  MEASUREMENT";:ELSE IF AN$="6"TH
EN PRINT" PLEASE -ENTER TOTAL NUMBER INCHES";
146Ø LOCATE 8,2:INPUT "WIDTH MAIN AREA";WM:GOSUB 18ØØ:LOCATE 8,4Ø:INPUT" LENGTH
MAIN AREA";LM:GOSUB  18ØØ
147Ø PRINT" ADD-ON  Areas (Y/N)":GOSUB 18ØØ
148Ø A1$=INKEY$:IF A1$=""THEN 148Ø
149Ø LOCATE 9,1:PRINT SPACE$(2Ø):LOCATE 9,1
15ØØ LOCATE 9,1:IF A1$="Y"THEN INPUT" WIDTH  ";AW:LOCATE 9,4Ø:INPUT" LENGTH ";AL
:FOR TI=1 TO 6ØØ:NEXT:LOCATE 9,1:PRINT SPACE$(78);:LOCATE 9,1
151Ø IF A1$<>"Y"THEN  157Ø
152Ø LOCATE 9,1:PRINT SPACE$(78):LOCATE 9,1:PRINT" OK. ANY MORE? (Y/N)":GOSUB  1
```

```
82Ø
153Ø A2$=INKEY$:IF A2$=""THEN 153Ø
154Ø LOCATE 9,1:PRINT SPACE$(2Ø);:LOCATE 9,1
155Ø IF A2$="Y" THEN COLOR 4:COLOR 4:PRINT" ADD ALL REMAINING ADD-ONS TOGETHER!"
:COLOR Ø
156Ø IF A2$="Y"THEN INPUT" WIDTH  ";BW:GOSUB 18ØØ:LOCATE 1Ø,4Ø:INPUT" LENGTH ";B
L:GOSUB 18ØØ
157Ø IF AN$="4"THEN JQ$="FOOT"
158Ø IF AN$="6"THEN JQ$="INCH"
159Ø FOR WIPE=9 TO 11:LOCATE WIPE,1:PRINT SPACE$(78);:NEXT:LOCATE 9,1
16ØØ PRINT" NOW:'CUT-OUTS'(MEASURE TO NEAREST ";JQ$;")"
161Ø PRINT" ARE THERE ANY? ( Y/N  )":GOSUB  182Ø
162Ø A3$=INKEY$:IF A3$=""THEN 162Ø
163Ø IF A3$<>"Y"THEN 169Ø
164Ø IF A3$="Y"THEN PRINT" WIDTH ";:INPUT CW:GOSUB 18ØØ:LOCATE 11,4Ø:INPUT" LENG
TH ";CL:GOSUB 18ØØ:LOCATE 9,1:PRINT SPACE$(236):LOCATE 9,1
165Ø PRINT" ANY MORE 'CUT-OUTS'?"
166Ø A4$=INKEY$:IF A4$=""THEN 166Ø
167Ø FOR WIPE=9 TO 13:LOCATE WIPE,1:PRINT SPACE$(78):NEXT
168Ø IF A4$="Y"THEN LOCATE 9,1:INPUT" WIDTH ";CX:LOCATE 9,4Ø:INPUT" LENGTH ";WX:
FOR DL=1 TO 6ØØ:NEXT
169Ø IF AN$="6" THEN 231Ø
17ØØ LOCATE 9,1:PRINT STRING$(8Ø,"_");:LOCATE 1Ø,1:PRINT SPACE$(4Ø):LOCATE 1Ø,1:
PRINT" COST PER SQ. YARD";:INPUT YC:GOSUB 18ØØ
171Ø PRINT" CARPETING CALCULATION:"
172Ø PRINT" YOU WILL NEED APPROX.";
173Ø CC=(WM*LM)+(AW*AL)+(BW*BL)-(CW*CL)-(CX*WX):YD=INT(CC/9)
174Ø PRINT YD;" SQ.YDS OF CARPET."
175Ø PRINT" YOUR COST WILL BE ABOUT...";:CS=YC*YD:PRINT USING"$#,###.##";CS:PRIN
T" FOR  THE ";RM$
176Ø PRINT" PRINT THIS? <Y/N>"
177Ø OG$=INKEY$:IF OG$=""THEN 177Ø
178Ø IF OG$="Y" OR OG$="y"  THEN GOSUB 283Ø
179Ø RUN 28Ø
18ØØ PLAY"O3V15L64T15ØCDE"
181Ø RETURN
182Ø PLAY"O3V15L64T15ØEDC"
183Ø RETURN
184Ø PLAY"O3V15L16C"
185Ø RETURN
186Ø '
187Ø '*** CONCRETE POURING HERE ***
188Ø '
189Ø COLOR Ø,3:CLS
19ØØ PRINT STRING$(8Ø,"*"):LOCATE 2,3Ø:PRINT"CONCRETE VOL.MEASURE"
191Ø LOCATE 3,1:PRINT STRING$(8Ø,"*");
192Ø PRINT"FOR CONCRETE MEASUREMENT YOU CAN FIRST OBTAIN THE HEIGHT,WIDTH AND DE
PTH OF THE MAJOR PART OF THE PROJECT. THEN WE CAN 'ADD- ON' THE OTHER AREAS AS R
EQUIRED OR TAKE-OFF ."
193Ø LINE(35Ø,12Ø)-(6ØØ,12Ø),3:LINE-(55Ø,14Ø),3:LINE-(3ØØ,14Ø),3:LINE-(35Ø,12Ø),
3
194Ø LINE-(35Ø,15Ø),3:LINE-(6ØØ,15Ø),3:LINE-(6ØØ,12Ø),3:LINE(6ØØ,15Ø)-(55Ø,17Ø),
3:LINE-(3ØØ,17Ø),3:LINE-(3ØØ,14Ø),3:LINE(3ØØ,17Ø)-(35Ø,15Ø),3:LINE(55Ø,17Ø)-(55Ø
,14Ø),3
195Ø PAINT(5ØØ,16Ø),2,3:PAINT(556,162),2,3
196Ø LOCATE 15,48:PRINT"Sample Concrete Pour"
197Ø W5$=CHR$(27)+"    LENGTH    "+CHR$(26):W6$=CHR$(27)+"HEIGHT"+CHR$(27)
198Ø LOCATE 23,48:PRINT W5$
```

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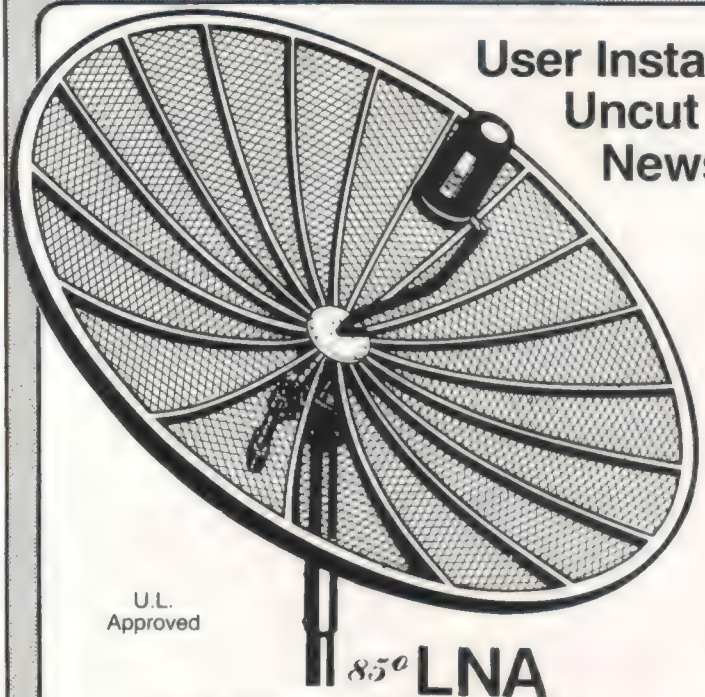

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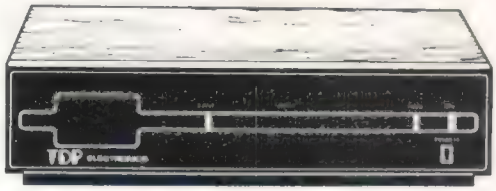

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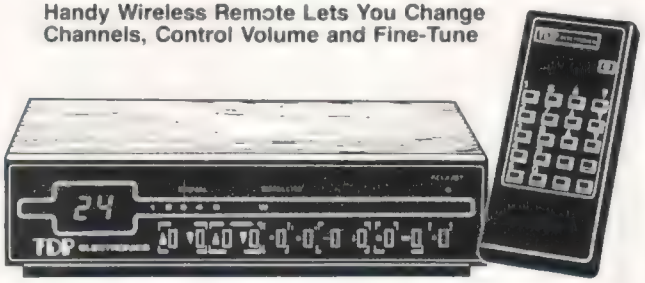

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199Ø FOR LT=15 TO 22:LOCATE LT,37:PRINT MID$(W6$,LT-14,1);:NEXT LT
2ØØØ LINE(62Ø,155)-(57Ø,175),4:LOCATE 21,73:PRINT"WIDTH"
2Ø1Ø LOCATE 9,1
2Ø2Ø PRINT" ENTER ALL MEASUREMENTS AS 'FEET'AND THEN REMAINING AS 'INCHES'."
2Ø3Ø LOCATE 1Ø,1:INPUT" WIDTH FT.";WF:LOCATE 1Ø,3Ø:INPUT"WIDTH + IN.";WI
2Ø4Ø LOCATE 11,1:INPUT" LENGTH FT.";LF:LOCATE 11,3Ø:INPUT"LENTH + IN.";LI
2Ø5Ø LOCATE 12,1:INPUT" HEIGHT(OR DEPTH) FT.";HF:LOCATE 12,3Ø:INPUT"HEIGHT + IN.
";HI
2Ø6Ø FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
2Ø7Ø MSQ=((WF*12)+WI)*((LF*12)+LI)*((HF*12)+HI)
2Ø8Ø LOCATE 1Ø,1:INPUT" ANY ADD-ON AREAS (Y/N)";AO$
2Ø9Ø IF AO$="Y"THEN 223Ø ELSE 211Ø
21ØØ FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
211Ø FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT
212Ø LOCATE 1Ø,1:INPUT" ANY TAKE-OFF AREA'S (Y/N)";TU$
213Ø IF TU$="Y"THEN 227Ø ELSE 214Ø
214Ø VCU=MSQ/46656!
215Ø FOR DL=1 TO 3ØØ:NEXT:FOR WIPE=1Ø TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø):NEXT:
LOCATE 1Ø,1
216Ø PRINT " TO COMPLETE PROJECT YOU WILL USE APPROXIMATLEY";:PRINT USING"###.#"
;VCU;:PRINT" CU.YDS OF CONCRETE."
217Ø PRINT" PRINT THIS? <Y/N>"
218Ø A$=INKEY$:IF A$=""THEN 218Ø
219Ø IF A$="Y"OR A$="y" THEN GOSUB  295Ø
222Ø RUN 28Ø
223Ø LOCATE 11,1:INPUT" WIDTH FT.";AW:LOCATE 11,3Ø:INPUT" WIDTH IN.";AK:LOCATE 1
2,1:INPUT" LENGTH FT.";AL:LOCATE 12,3Ø:INPUT" LENGTH IN.";AI:LOCATE 13,1:INPUT"
HEIGHT FT.";AH:LOCATE 13,3Ø:INPUT" HEIGHT IN.";AJ
224Ø ACU=((AW*12)+AK)*((AL*12)+AI)*((AH*12)+AJ)
225Ø MSQ=MSQ+ACU
226Ø FOR DL=1 TO 5ØØ:NEXT:GOTO 211Ø
227Ø LOCATE 11,1:INPUT" WIDTH FT.";TW:LOCATE 11,32:INPUT" WIDTH IN.";TX:LOCATE 1
2,1:INPUT" LENGTH FT.";TL:LOCATE 12,3Ø:INPUT" LENGTH IN.";TY:LOCATE 13,1:INPUT"
HEIGHT FT.";TH:LOCATE 13,3Ø:INPUT" HEIGHT IN.";TZ
228Ø TCU=((TW*12)+TX)*((TL*12)+TY)*((TH*12)+TZ)
229Ø MSQ=MSQ-TCU
23ØØ GOTO 214Ø
231Ø FOR WIPE=7 TO 13:LOCATE WIPE,1:PRINT SPACE$(8Ø);:NEXT:LOCATE 7,1:PRINT" TIL
E  CALCULATIONS:"
232Ø PRINT" ARE YOU USING 9 OR 12 INCH TILES (9 or 12)";
233Ø INPUT TL$
234Ø IF TL$="9"OR TL$="12"THEN 235Ø ELSE 233Ø
235Ø TL=VAL(TL$)
236Ø GOSUB 243Ø:W4=INT(CW/TL):L4=INT(CL/TL):W5=INT(CX/TL):L5=INT(WX/TL)
237Ø TN=(W1*L1):IF A1$="Y" THEN TN=TN+(W2*L2):IF A2$="Y"THEN TN=TN+(W3*L3)
238Ø IF A3$="Y" THEN TN=TN-(W4*L4):IF A4$="Y"THEN TN=TN-(W5*L5)
239Ø PRINT" YOU WILL NEED ";INT(TN)+1;" TILES
24ØØ PRINT" PRINT THIS? (Y/N)"
241Ø A$=INKEY$:IF A$=""THEN 241Ø
242Ø IF A$="Y" OR A$="y" THEN 3Ø3Ø ELSE RUN 28Ø
243Ø IF WM/TL<>INT(WM/TL)THEN W1=INT(WM/TL)+1 ELSE W1=WM/TL
244Ø IF LM/TL<>INT(LM/TL)THEN L1=INT(LM/TL)+1 ELSE L1=WM/TL
245Ø IF AW/TL<>INT(AW/TL)THEN W2=INT(AW/TL)+1 ELSE W2=AW/TL
246Ø IF AL/TL<>INT(AL/TL)THEN L2=INT(AL/TL)+1 ELSE L2=AL/TL
247Ø IF BW/TL<>INT(BW/TL)THEN W3=INT(BW/TL)+1 ELSE W3=BW/TL
248Ø IF BL/TL<>INT(BL/TL)THEN L3=INT(BL/TL)+1 ELSE L3=BL/TL
249Ø RETURN
25ØØ '
```

```
251Ø '*** PRINTOUT HEADING ***
252Ø '
253Ø LPRINT STRING$(5,13):LPRINT TAB(5)STRING$(7Ø,"*"):LPRINT TAB(5)STRING$(7Ø,"
*"):LPRINT :LPRINT TAB(32)"* HANDI 1ØØØ *":LPRINT :LPRINT TAB(33)"JOB ESTIMATE"
254Ø LPRINT :FOR  ZV=1 TO 2:LPRINT TAB(5)STRING$(7Ø,"*"):NEXT
255Ø LPRINT :LPRINT :RETURN
256Ø '
257Ø '*** PANELING PRINTOUT ESTIMATE ***
258Ø '
259Ø  GOSUB 253Ø
26ØØ LPRINT TAB(2Ø)"PANELING CALCULATIONS:  "+RM$:LPRINT
261Ø GOSUB 3Ø9Ø
262Ø LPRINT TAB(2Ø)"TOTAL SHEETS NEEDED:  ";:LPRINT USING "###.#";NP
263Ø RETURN
264Ø '
265Ø '*** PAINTING ESTIMATE PRINTOUT ***
266Ø '
267Ø GOSUB 253Ø:LPRINT TAB(2Ø)"PAINTING CALCULATIONS:  "RM$:LPRINT
268Ø GOSUB 3Ø9Ø
269Ø LPRINT TAB(2Ø)"COST OF PAINT: "+"$"+CG$+" PER GALLON":LPRINT TAB(2Ø)"APPLYI
NG "+NC$+" COATS":IF A$="Y" THEN CO$="CEILING INCLUDED" ELSE CO$="CEILING NOT IN
CLUDED"
27ØØ LPRINT TAB(2Ø)CO$:LPRINT TAB(2Ø)"SPREAD RATE: "FG$" SQ. FT PE GALLON":LPRIN
T :LPRINT TAB(2Ø)"YOU WILL NEED ";:LPRINT USING"###.#";GN;:LPRINT " GALLONS":LPR
INT TAB(2Ø)"APPROXIMATE COST: ";:LPRINT USING "$####.##";CP
271Ø RETURN
272Ø '
273Ø '*** WALPAPER JOB ESTIMATE PRINTOUT ***
274Ø '
275Ø GOSUB 253Ø:LPRINT TAB(2Ø)"WALLPAPER CALCULATION: "+RM$:LPRINT :IF SS$="Y" T
HEN S1$="SINGLE SIZE ROLL" ELSE IF SS$="N" THEN S1$="DOUBLE SIZE ROLLS"
276Ø LPRINT TAB(2Ø)S1$:LPRINT TAB(2Ø)"WALL HEIGHT:"HW" FEET":LPRINT TAB(2Ø)NW"WA
LLS "VAL(WA$)" FEET LONG":LPRINT TAB(2Ø)SB"WALLS "VAL(WB$)" FEET LONG"
277Ø LPRINT TAB(2Ø)NZ "WINDOWS":LPRINT TAB(2Ø)ND "DOORS":LPRINT TAB(2Ø)"COST PER
 ROLL: ";:LPRINT USING"$###.##";CR:LPRINT
278Ø LPRINT TAB(2Ø)"YOU WILL NEED ";RO;" ROLLS":LPRINT TAB(2Ø)"YOUR COST: ";:LPR
INT USING"$###.##";CR*RO:LPRINT STRING$(5,13)
279Ø RETURN
28ØØ '
281Ø '*** CARPETING ESTIMATE PRINTOUT ***
282Ø '
283Ø GOSUB 253Ø:LPRINT TAB(2Ø)"CARPETING CALCULATION: "+RM$
284Ø LPRINT :LPRINT TAB(2Ø)"MAIN AREA "WM" BY "LM" FEET"
285Ø IF A1$<>"Y" THEN 287Ø
286Ø LPRINT TAB(2Ø)"ONE ADD-ON "AW" BY "AL" FEET":IF A2$="Y" THEN LPRINT TAB(2Ø)
"OTHER ADD-ONS "BW" BY "BL" FEET"
287Ø IF A3$<>"Y" THEN 289Ø
288Ø LPRINT TAB(2Ø)"ONE CUTOUT "CW" BY "CL" FEET":IF A4$="Y" THEN LPRINT TAB(2Ø)
"OTHER CUTOUTS "CX" BY "WX" FEET"
289Ø LPRINT TAB(2Ø)"COST PER SQ/YD";:LPRINT USING"$###.##";YC
29ØØ LPRINT :LPRINT TAB(2Ø)"YOU WILL NEED"YD" SQUARE YARDS":LPRINT TAB(2Ø)"TOTAL
 COST: ";:LPRINT USING"$#,###.##";CS:LPRINT STRING$(5,13)
291Ø RETURN
292Ø '
293Ø ' *** CONCRETE JOB ESTIMATE PRINTOUT ***
294Ø '
295Ø GOSUB 253Ø:LPRINT TAB(2Ø)"CONCRETE ESTIMATE":LPRINT :LPRINT TAB(2Ø)"*****MA
IN AREA*****":LPRINT :LPRINT TAB(2Ø)"WIDTH"WF" FEET"WI" INCHES":LPRINT TAB(2Ø)"L
```

```
ENGTH"LF" FEET"LI" INCHES":LPRINT TAB(2Ø)"DEPTH"HF" FEET"HI" INCHES":LPRINT
296Ø IF AO$="Y" THEN LPRINT TAB(2Ø)"*****ADD-ONS*****":LPRINT :LPRINT TAB(2Ø)"WI
DTH"AW" FEET"AK" INCHES":LPRINT TAB(2Ø)"LENGTH"AL" FEET"AI" INCHES":LPRINT TAB(2
Ø)"DEPTH"AH" FEET"AJ" INCHES":LPRINT
297Ø IF TU$="Y" THEN LPRINT TAB(2Ø)"******CUTOUTS*****":LPRINT :LPRINT TAB(2Ø)"W
IDTH"TW" FEET"TX" INCHES":LPRINT TAB(2Ø)"LENGTH"TL" FEET"TY" INCHES":LPRINT TAB(
2Ø)"DEPTH"TH" FEET"TZ" INCHES":LPRINT
298Ø LPRINT TAB(2Ø)"TOTAL CUBIC YARDS REQUIRED: ";:LPRINT USING"###.##";VCU
299Ø RUN 28Ø
3ØØØ '
3Ø1Ø '*** TILING A FLOOR ESTIMATE PRINTOUT ***
3Ø2Ø '
3Ø3Ø GOSUB 253Ø:LPRINT TAB(2Ø)"FLOOR TILE CALCULATIONS: "+RM$:LPRINT
3Ø4Ø LPRINT TAB(2Ø)"MAIN AREA "WM"BY "LM"INCHES"
3Ø5Ø IF A1$="Y" THEN LPRINT TAB(2Ø)"ONE ADD-ON"AW" BY"AL" INCHES":IF A2$="Y"THEN
 LPRINT TAB(2Ø)"OTHER ADD-ONS"BW" BY"BL" INCHES"
3Ø6Ø IF A3$="Y" THEN LPRINT TAB(2Ø)"ONE CUTOUT"CW" BY "CL" INCHES":IF A4$="Y" TH
EN LPRINT TAB(2Ø)"OTHER CUTOUTS"CX" BY"WX" INCHES"
3Ø7Ø LPRINT TAB(2Ø)"BY USING"TL" INCH TILES-":LPRINT TAB(2Ø)"YOU WILL NEED ";INT
(TN+1);" TILES"
3Ø8Ø RUN 28Ø
3Ø9Ø LPRINT TAB(2Ø)"WALL HEIGHT: "+HA$+" FEET "+HB$+" INCHES ":LPRINT TAB(2Ø) AZ
;:LPRINT" WALLS "+WF$+" FEET "+WI$+" INCHES ":LPRINT TAB(2Ø) AX;:LPRINT" WALLS "
+WG$+" FEET "+WJ$+" INCHES"
31ØØ LPRINT TAB(2Ø)WN" REGULAR WINDOWS":LPRINT TAB(2Ø)OQ" PICTURE WINDOWS":LPRIN
T TAB(2Ø)DR" DOORS"
311Ø LPRINT :RETURN
```

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PCM

A Brief Survey of Basic Spreadsheet Functions

By Richard A. White
PCM Contributing Editor

A spreadsheet contains a variety of predefined mathematical formulas called functions. These are built-in operations that can quickly perform a task that would otherwise take much longer or which might not be able to be performed at all. In many instances, functions also save memory space since they remove the need to type in long formulas.

A widely used statistical function is @SUM(*x...y*). It simply adds up all the numbers in a row, column or block. The form shown is from *VisiCalc* and *Lotus 1-2-3*. For the discussion below, I will use Lotus syntax. Your spreadsheet may use a somewhat different form, but will work much the same way. Simpler spreadsheets may not contain all the functions discussed, but quite a few are now common to most spreadsheets.

The "at" symbol (@) serves to distinguish the function from a normal label entry. The characters within the parentheses form the argument of the function. An argument is information that a function needs in order to perform its task. In @SUM(*x...y*) the argument is the cell or cells that are to be added together.

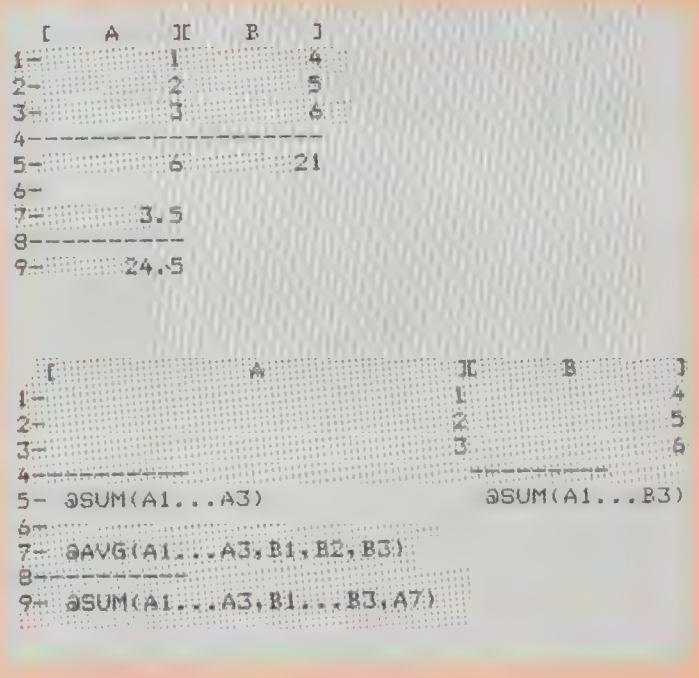
@SUM(C6...C25) Compute the sum of the values in cells C6 to C25.

It does not matter in *1-2-3* whether the values have been directly entered or have been calculated by some other formula or function. *1-2-3* does natural recalculation. This means that it determines which cells need to be evaluated to produce values for functions or formulas in other cells to use. It then calculates these first.

Most other spreadsheets are not so kind. They will use a calculated value from another cell in a formula or function, but do not make sure it is properly calculated first. As long as you know this can happen, you can handle the matter yourself by doing a number of manual recalculations to assure that all formulas and functions are using properly calculated values.

Many functions perform on a range of values. In some spreadsheets, some functions can handle a block as a range, while the same function in other spreadsheets cannot. 1-2-3 handles blocks as I have shown for those functions that accept them. Experiment with your spreadsheet to see what it can do.

Figure 1: Sample Spreadsheet and Formulas.



The more I dug into ways to specify the argument for @SUM( ) and other statistical functions, the more hidden power I found. In Figure 1, I show a simple example with numbers in cells A1 ... B3 and the results of some calculations. The formula dump is shown below. In Cell A5

(Richard White has a long background with microcomputers and specializes in BASIC programming. He has authored numerous programs and articles. His work has appeared in PCM's sister publication, THE RAINBOW.)

is a simple summation of the row A1 . . . A3. In Cell B5, the summation is taken over the block A1 . . . B3.

In cells A7 and A9, we see that the functions can accept a series of ranges and single cells in the argument. This can open all sorts of possibilities in that it starts to free you from having to think about how you are going to organize your spreadsheet in order to simply perform one of these functions at the end. You still need to organize the spreadsheet logically so you and others can easily understand it and its results when it's done.

```
@SUM(A1...A3,B1...B3,A7)
```

Note that each range or cell citation is separated by a comma. In addition to being somewhat faster, @SUM( ) and the other range functions are more adaptable to changes made in the spreadsheet. Figure 2 shows Column A added using a straight cell addition formula. Column B uses @SUM( ).

Figure 2: Spreadsheet Using Cell Addition and @SUM( ) Before Row is Deleted.

```
   [      A      ][      B      ]
1-              1              4
2-              2              5
3-              3              6
4-----------   ----------
5- +A1+A2+A3  @SUM(B1...B3)
```

Figure 3: Spreadsheet Using Cell Addition and @SUM( ) After Row 2 is Deleted.

```
   [      A      ][      B      ]
1-              1              4
2-              3              6
3-----------   ----------
4- +A1+ERR+A2  @SUM(B1...B2)
```

When Row 2 is deleted the spreadsheet tries to adjust the formulas. In the case of @SUM( ) it can, since the missing cell was within the defined range, which is simply shortened by changing B3 to B2. The addition formula always has three cell entries. The spreadsheet was able to adjust A3 to A2, but it cannot make the old A2 entry go away. ERR is entered in its place and will be displayed when the sheet is recalculated.

Of course a range function is not totally forgiving. If you delete the start or end cell of the range, ERR will be substituted. Let's now see what happens when we go the other way and insert a row and add data to it.

Figure 4: Spreadsheet Using Cell Addition and @SUM( ) After a Row of Data is Added.

```
   [      A      ][      B      ]
1-              1              4
2-              2              5
3-            100            100
4-              3              6
5-----------   ----------
6- +A1+A2+A4   @SUM(B1...B4)
```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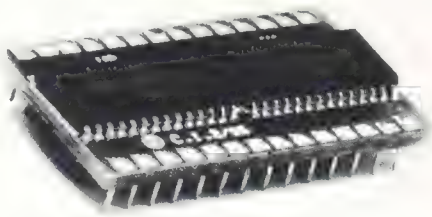

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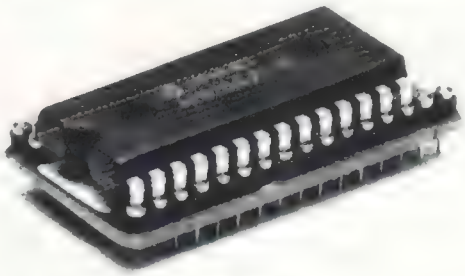

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In the addition formula, the A3 reference was changed to A4. The result returned in A6 remains 6. @SUM( ) includes the new row and its data in its calculation and puts 115 into B6 rather than 15. In most instances, the reason you added columns or rows was to make room for a larger range of data, and you expect to have the added figures included in the calculation. When you use a range function and make sure that the new rows or columns are between the start and end cells, you are automatically taken care of.

Figure 5: Preferred Way to Define a Range for @SUM( ).

```
   [      A      ][      B      ]
1-Heading A      Heading B
2-                1              4
3-                2              5
4-              100            100
5-                3              6
6----------      ---------
7-  +A2+A3+A5     @SUM(B1...B6)
```

Figure 5 shows a better way to define ranges for the @SUM( ) function. Be careful, since it is the wrong way to describe a range to other functions. I inserted a row at the beginning of the sheet and have shown column headings. I left the formula now in A7 alone to show how the sheet will adjust formulas. I changed the range of @SUM( ) to include both the cell containing the heading and the cell containing the dashed line indicating a summation. B1 and B6 have math values of zero and will not affect the summation. If you add extra lines for data, you are most likely to add them below the heading or above the dashed line and will always have your new lines within the range.

@COUNT( ) is another range function. @COUNT( ) counts only those cells that have a mathamatical value including a zero. @COUNT( ) ignores all blank cells, but considers all cells containing labels as containing zero and counts them. Given this, the better way to describe a range to @SUM is the wrong way to describe the range for @COUNT( ) in *1-2-3*, unless you really want to count cells containing labels. I rather doubt that you will. We can make the point stronger with @AVG( ) that works the same as @COUNT( ). You don't really want a header, valued as a zero, included in your average. @MAX( ) and @MIN( ) work the same way.

Those with other spreadsheets, including *VisiCalc*, must check exactly how their particular sheet works. @COUNT( ), @AVERAGE( ), @MAX( ) and @MIN( ) in *DynaCalc* on my Color Computer are able to ignore labeled cells within a range where the same functions on *1-2-3* cannot. And, many times, documentation with programs is either silent on the subject or whatever mention there is is buried in an avalanche of detail. The best way to know is to fire up your spreadsheet and do some testing.

@COUNT( ) has one other feature (read maybe bug) that you should know about. @COUNT(A1) will return a one *even if* A1 is blank. Further, any @COUNT( ) function whose argument contains a single cell reference will return at least a one. Assume that cells A1 . . . B2 are all empty. Following are a number of @COUNT( ) functions and how they react.

```
@COUNT(A1) = 1
@COUNT(A1...A2) = 0
@COUNT(A1...A2,B1) = 1
```

This apparently is not a bug since *DynaCalc* on my Color Computer works in an identical fashion. However, I am hard pressed to tell you what value this "feature" has.

One final *1-2-3* "feature" is that @AVG( ) returns an ERR if the range consists entirely of blank cells. I am of mixed mind on this. If other cells in the spreadsheet depend on this average, it might be worthwhile to flag the lack of data. *DynaCalc* returns a zero, which may not be worth much, but which may not be as upsetting to the operator.

For those who need to calculate statistics, many spreadsheets can calculate the variance, VAR(*list*) and standard deviation STD(*list*) for a set of data. I will presume that those who are familiar with these statistical functions and who need to use them will be able to figure out how to use them. If you are not familiar with them, you either don't need them or need far more training than I can give in the column.

The financial functions built into a spreadsheet generally deal with the time value of money. Many larger businesses use the time value of money to select their investments. The idea is that there are always more ways to spend money than there is money to spend. There need to be ways to compare various investments and to choose the best ones from a current prospective. One of the problems is the cash flow each year that an investment may generate varies with time.

Let's consider a fictional company that makes "Whatits" and "Thatits." $400,000 is available for investment this year and the Whatits and Thatits division managers have been asked to submit plans for that amount of investment in one or the other of the divisions. The investment plans will include estimates of the annual savings and revenue each investment will produce. The company wants at least a 15 percent discounted rate of return. We will see what that means later.

Whatits and Thatits are two very different businesses. Whatits division has to buy some parts from the outside now and investment now would save growing amounts over the next few years, stabilizing five to six years out at $150,000 annual savings after taxes.

Thatits is booming and a $400,000 investment this year will produce $200,000 after tax revenue next year. But, competition is coming and Thatits is sort of a trendy item. The company cannot count on being in the business seven or eight years from now.

An entrepreneur will typically make a gut feeling decision on the data. In this case neither decision will lead to bankruptcy. On a cash flow basis, one is better than the other and should maximize company profit and strength. *1-2-3*'s @NPV( ) is a tool to make the choice. Figure 6 shows the spreadsheet.

Figure 6: A Project Return Analysis Spreadsheet.

	A	B	C	D
1		PROJ 1	PROJ 2	PROJ 3
2		WHATITS	THATITS	WHATITS
3				
4	INVEST TODAY	400000	400000	0
5				
6				
7	RETURN			
8	YEAR 1	25000	200000	-25000
9	YEAR 2	50000	175000	-50000
10	YEAR 3	75000	150000	-75000
11	YEAR 4	100000	100000	100000
12	YEAR 5	125000	75000	125000
13	YEAR 6	150000	50000	150000
14	YEAR 7	150000	25000	150000
15	YEAR 8	150000	0	150000
16	YEAR 9	150000	0	150000
17	YEAR 10	150000	0	150000
18				
19	TOT. RETURN	1125000	775000	825000
20				
21	NET PRES VAL	478174	530344	260454

Project 1 and Project 2 represent the respective proposals of the Whatits and Thatits division managers. Each proposes to invest $400,000 this year. Project 1 returns much more cash to the company over 10 years, but much of the return comes in later years. Project 2 returns lots of cash in the early years and then peters out. A primary question is which project has the greatest net present value. Cells in row 21 contain a @NPV( ) function. The one in B21 reads:

```
@NPV(.15,B8...B17)
```

Cells C21 and D21 have similar formulas adjusted for their column positions. One way to look at @NPV( ) is that the current value of money earned in the future is reduced by the compounded interest that amount of money would earn between then and now. If I put $1,000 in the bank, two years from now I have the $1,000 plus earned interest. If I invest $1,000 now, earn no interest over the next two years and the get back $1,100, I will probably have less money at that time than if I had put the money into the bank. The net present value of the money investment is less than that put into the bank to draw interest in the CD.

So the first argument in @NPV( ) is the interest rate or the rate I expect or need to be returned on the capital I invest. Rate of return for short. It is entered as a decimal number though we talk about 15 percent interest. The next argument specifies the range over which @NPV( ) works.

There is one "big watchout" when you use @NPV( ). The first entry in the range must apply to the first interest period. Each succeeding entry must pertain to a succeeding period. The periods must be equal. For most applications, use an annual interest rate or rate of return, entered as a decimal number rather than a percentage, and have your periods be years.

Now we can see differences between the two projects. Project 1 has a larger total return, but Project 2's net present value is better. A more sophisticated analysis would show that Project 2 would pay back its capital investment much sooner, making more money available earlier for other investments. And who can say that the Whatits business will really be as projected five years out. Certainly the projection of Thatits return over the next two years is on much firmer ground.

On the basis of the spreadsheet, the company should invest in Thatits now while they address what to do about the Whatits business. There is some time to act there while there isn't in the Thatits business.

One option is to invest the $400,000 three years from now when Whatits savings start to peak. The net present value of that approach is only $260,000, but the net present value of the investment three years out is also about $260,000. The company can afford to wait and still meet their investment objectives. PCM

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Access BIOS to scan the keyboard, control windows, and more — all from BASIC

A Potpourri of BIOS Goodies

By Robert D. Covington

In the last few months, I have described quite a few subroutines that allow GW-BASIC to access features in MS-DOS that are normally only accessible from the DOS command level or other languages.

This month, I will conclude this miniseries on the MS-DOS access subroutine by describing a few remaining subroutines that use MS-DOS's BIOS.

Keyboard Subroutines

Lines 21000 through 23000 of Program 1 contain three subroutines that access MS-DOS's keyboard BIOS.

The subroutine starting at Line 21000, scans the keyboard somewhat like BASIC's INKEY$ function. Unlike INKEY$, however, this routine waits for a key to be pressed. This means that the only way to exit this subroutine is to press a key (remember that!). In addition, the most important feature of this subroutine is that it returns the scan code for the character pressed. The scan code is a unique 8-bit number for each of the characters and character sequences on the keyboard.

A list of keyboard scan codes can be found in Appendix D of the *Model 2000 MS-DOS Reference Manual*. Scan codes are especially nice when you wish to make use of the SHIFT, ALT and CTRL in conjunction with the function keys allowing for 48 (40 on the Tandy 1200) individual codes from the function keys. In addition, scan codes also allow you to detect keys that are not converted to individual ASCII characters (like the SHIFT keys). This subroutine has no entry requirements but exits with the ASCII value of the key pressed in C and the scan code in SC.

The subroutine at 22000 returns the current shift status of the keyboard. In most cases, this function's only practical use in GW-BASIC is for detecting the CAPS and NUM LOCK keys. On exit from this subroutine, SS contains an eight-bit number describing the eight possible shift statuses. Table 1 describes each of these shift statuses along with their bit position. (To detect one of the shift conditions, AND SS with 2 to the power of the bit to detect.) For example, to check the status of the CAPS lock key, the following operation could be performed:

```
X=SS AND 2^6
```

Then, if X is greater than zero, the bit is set. Otherwise, if X is equal to zero, the bit is reset and the selected shift is not set.

Probably the most useful subroutine in this set of keyboard subroutines starts at Line 23000. This subroutine flushes (clears) any characters that are stored in the keyboard's type-ahead buffer. Flushing the keyboard buffer is very useful for clearing out any extra characters that might have been typed on single key input entries (INKEY$ for example).

If a question was asked that required a Y or N response, the user might end up typing YES or NO. If this happens, the ES or O is stored in the type-ahead buffer and is released at the next input prompt. If an E or O is a valid entry at the next input prompt, it could select an option in a program that the user did not really want. To alleviate this problem, a GOSUB 23000 (or the equivalent line number in your application program) could be inserted right before the second input prompt to clear any characters that might have been accidently entered, or characters from keyboard bounce.

Display Subroutines

While most of the features of the display BIOS are supported in GW-BASIC, one feature that is not supported is multidirectional and windowed screen scrolling.

In Program 1, the subroutines starting at 24000 and 25000, respectively, scroll the text inside a window on the screen up or down. A window is defined as an area on the screen with borders defined by four points (much in the

(Bob Covington has been a computer programmer and consultant for the past six years, most recently focusing his attention on both the Model 100 and the 2000. He is also a technical writer and editor. Bob can be contacted at P.O. Box 37007, St. Louis, MO 63141.)

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same way as the LINE instruction uses four points to make a box in GW-BASIC). Windows are very convenient when you wish to divide the 80-by-25 character screen into smaller sections with independent text.

With the subroutines at 24000 and 25000, the upper left corner of the window is defined by UC (column position) and UR (row position.) Likewise, the lower right corner of the window is defined by BC (column) and BR (row). With all four of these coordinates, the position vector starts with zero (instead of one, as does the LOCATE statement). For example, if you wished to describe the entire screen as a window, the following variable assignments would need to be made:

```
UC=0:UR=0:BC=79:BR=24
```

In addition to the window coordinates, the subroutines at 24000 and 25000 require that NS contain the number of lines to scroll, and AT the attribute to fill the blank line with. If NS contains a zero, the entire window will be erased.

The subroutine at 26000, like the above subroutines, allows a window to be scrolled. This subroutine, however, is a bit more flexible in that it allows the screen to be scrolled in any of the four directions (up, down, left and right). On entry to this subroutine, UC, UR, BC, BR and NS are set up like the above two subroutines. In addition, DS contains a value from zero to three specifying the direction the window is to be scrolled (zero-up, one-down, two-left and three-right).

Miscellaneous BIOS Subroutines

Lines 27000-29010 of Program 1 contain two subroutines that access a few of the more trivial BIOS functions.

The subroutine at 27000 performs a "cold" reboot of the entire system. This function has the same effect as hitting CTRL-ALT-DELETE on the keyboard. This subroutine is very useful when a BASIC program has created a CONFIG.SYS or AUTOEXEC.BAT file that needs to be installed or executed. For obvious reasons, this subroutine has no practical entry or exit parameters.

The subroutine at 29000 loads MS with the total amount of RAM in K (1024 byte increments) that is currently installed in the system. This function is very useful when attempting to create a CONFIG.SYS file inside a BASIC program. By using this function, a BASIC program can determine how much space can be allocated for disk caches, RAM disk, communications buffers, etc. When using this function, be sure not to detect memory boundries by exact values. For example, to detect the presence of 512K in the system, do not check if MS is equal to 512, but check to see that it is greater than 500. This has to be done since this function returns a value that is slightly smaller than the actual RAM in the system (usually 1K to 2K less than the actual value).

This concludes all of the routines that utilize the MS-DOS access subroutine. Even though I have described subroutines that allow access to most of MS-DOS's features, a few more trivial features have yet to be implemented in BASIC. Because of this, you might want to purchase Radio Shack's *MS-DOS Programmer's Reference Manual* (26-5403 for the Model 2000 or 25-1503 for the 1000/1200) and see if there are any other functions in MS-DOS that might be usable by your application programs.

References:

MS-DOS Programmer's Reference Manual, Tandy (26-5403)

Table 1

Shift Status Bit Configurations

Bit	Key/Mode	AND Value
0	Right SHIFT	1
1	Left SHIFT	2
2	CTRL	4
3	ALT	8
4	Scroll mode	16
5	NUM LOCK	32
6	CAPS lock	64
7	INSERT mode	128

Programmer's Reference Manual Correction

The *Model 2000 Programmer's Reference Manual* (26-5403) contains a few errors:

- On Page 33, the entry condition to "CONIO" should be:

  AH=06H
  DL=0FFH for keyboard input
  or
  DL=ASCII value of character to display (0-254)

- On Page 207, the multidirectional scroll has an additional entry condition:

  AL=number of lines to scroll (0 to blank window)

I have found a few more possible additions/corrections in the manual and I will forward them as soon as possible.

The listing:

```
1 ' *** MSDOS Function Subroutines for BASIC
2 ' *** By Robert D. Covington
1Ø DIM B$,AX,BX,CX,BP,SI,DI,SW
2Ø FOR X=1 TO 1ØØ:READ A:BIOS$=BIOS$+CHR$(A):NEXT:X=FRE(BIOS$):V=VARPTR(BIOS$):B
IOS!=PEEK(V+1)+PEEK(V+2)*256
25 CLS:PRINT"Program Installed...."
999 END
21ØØØ ' *** Get key from keyboard queue (wait if nescessary)
21ØØ1 '  Entry:
21ØØ2 '          C - ASCII character from queue
21ØØ3 '          SC - Keyboard scan code
21ØØ4 '
21Ø1Ø I=22:AX%=Ø:GOSUB 4ØØØØ:C=PEEK(VARPTR(AX%)):SC=PEEK(VARPTR(AX%)+1):RETURN
22ØØØ ' *** Get shift status
22ØØ1 '  Exit:
22ØØ2 '          SS - Shift status (see Table 1)
22ØØ3 '
22Ø1Ø I=22:AX%=512:GOSUB 4ØØØØ:SS=PEEK(VARPTR(AX%)):RETURN
23ØØØ ' *** Flush keyboard queue
23ØØ1 '          No entry or exit parameters
23ØØ2 '
23Ø1Ø I=22:AX%=768:GOTO 4ØØØØ
24ØØØ ' *** Scroll window up
24ØØ1 '  Entry:
24ØØ2 '          UC - Upper left column of window (Ø - 79)
24ØØ3 '          UR - Upper left row of window (Ø - 24)
```


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```
24004 '         BC - Lower right column of window (Ø - 79)
24005 '         BR - Lower right row of window (Ø - 24)
24006 '         NS - Number of lines to scroll (Ø - clear window)
24007 '         AT - Attribute or color to put in blank line(s) (7 usually)
24008 '
24010 AX%=1536+NS:BX%=AT*256
24020 I=16:CX%=UR*256+UC:DX%=BR*256+BC:GOTO 40000
25000 ' *** Scroll window down
25001 '  Entry:
25002 '         UC - Upper left column of window (Ø - 79)
25003 '         UR - Upper left row of window (Ø - 24)
25004 '         BC - Lower right column of window (Ø - 79)
25005 '         BR - Lower right row of window (Ø - 24)
25006 '         NS - Number of lines to scroll (Ø - clear window)
25007 '         AT - Attribute or color to put in blank line(s) (7 usually)
25008 '
25010 AX%=1792+NS:BX%=AT*256:GOTO 24020
26000 ' *** Universal scroll routine
26001 '  Entry:
26002 '         UC - Upper left column of window (Ø - 79)
26003 '         UR - Upper left row of window (Ø - 24)
26004 '         BC - Lower right column of window (Ø - 79)
26005 '         BR - Lower right row of window (Ø - 24)
26006 '         NS - Number of lines to scroll (Ø - clear window)
26007 '         DS - Direction of scroll (Ø-up, 1-down, 2-left, 3-right)
26008 '
26010 AX%=4608+NS:BX%=256+DS:GOTO 24020
27000 ' *** Reboot system
27001 '         No entry or exit conditions
27002 '
27010 I=25:GOTO 40000
29000 ' *** Get memory size
29001 '  Exit:
29002 '         MS - Memory size in number of k (1024 byte increments)
29003 '
29010 I=18:GOSUB 40000:MS=AX%:RETURN
31000 ' *** Convert Integer to signed integer
31001 '  Entry:
31002 '          A! - Integer (Ø-65535)
31003 '  Exit:
31004 '          A% - Signed Integer (-32768 - 32767)
31005 '
31010 IF A!>32767 THEN A%=A!-65536! ELSE A%=A!
31015 RETURN
40000 ' *** Call DOS function
40001 ' I - Interrupt Number
40002 ' AX%, BX%, CX%, DX%, BP%, SI%, and DI% - Registers passed to and from DOS
40003 ' SW% - Status word
40004 '
40010 MID$(BIOS$,48,1)=CHR$(I):CALL BIOS!(AX%,BX%,CX%,DX%,BP%,SI%,DI%,SW%):RETUR
N
50000 ' Program:BIOS       Length: 100 bytes
50001 DATA 30,7,139,236,139,94,4,255,55,157,139,94,6,139,63,139,94,8,139,55,139,
94,12,139,23,139,94,14,139,15,139,94,18,139,7,139,94,16,139,31,139,110,10,139,11
0,0,205,33,85,83,139,236,139,94,8,156,143,7,139,94,10,137,63,139,94,12
50002 DATA 137,55,139,94,16,137,23,139,94,18,137,15,139,94,22,137,7,91,139,110,2
0,137,94,0,139,110,14,91,137,94,0,202,16,0
```

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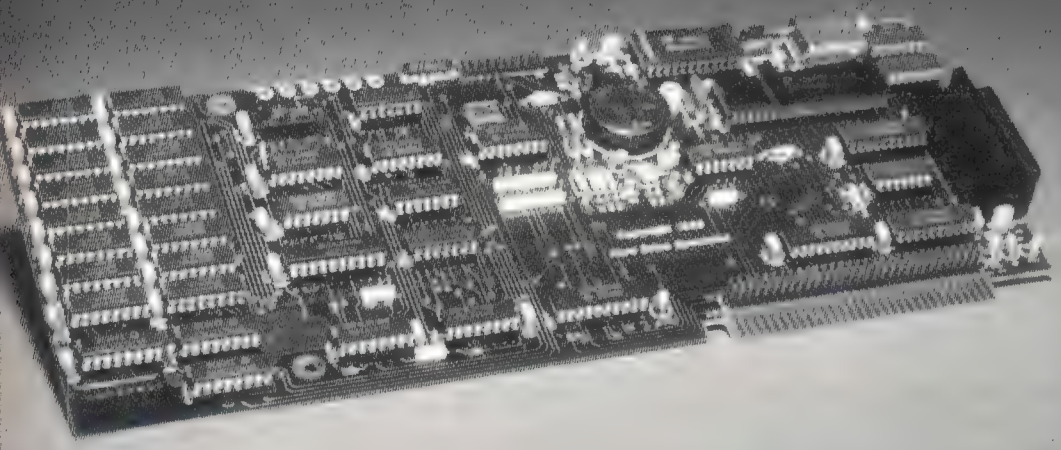

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Of Old Friends, Lead Time and Electronic Publishing

By Randy Graham
PCM Contributing Editor

A recent project led me to revisit some old friends online. I needed to use a bulletin board that I had not called for several years. There was no answer to my call this time. Were they off the air, or had they relocated or changed their number? Where could I find a current listing for this particular bulletin board? Hang on to that question; first, let's talk about the publishing concept of "lead time."

"Lead time" is a term used by writers, editors and publishers to refer to the delay from the time the author finishes his work to the time it is in the readers' hands. To the author, it is that period after which he can no longer make corrections to his text or update his references.

One way to cut lead time is to simplify the editing and publishing process: leave off some of the frills, move things faster from department to department, or distribute directly to the readers as when you publish a magazine. However, lead time for a magazine can run three months or more.

In the popular mind, writers, editors and publishers get frantic about "deadlines" — and they are vital to publication commitments. But as a writer who wants to be informative, I am constantly concerned about how up-to-date I can be.

This leads us to electronic information dissemination and back to my original question: Where can I find information about a specific bulletin board or database, or one dedicated to a particular need I have? Well, there are a number of good books on the market. I keep two on my computer bookshelf, *The Computer Phone Book* by Mike Cane (New York, New American Library, 1983, $9.95) and *OMNI's Online Database Directory* by Mike Edelhart and Owen Davies (New York, Collier Books, 1983). How current would the information be that I found there? Computer magazines will have more recent listings but are seldom comprehensive. How can I be sure that I am looking at a complete, accurate list? Enter the old friends.

Peoples Message Service was a pioneer in promoting personal computing and should probably get credit for inventing the concept if not the term "user friendly." They maintain a comprehensive directory of databases, which you can call directly in California (619) 561-7277. You can also find copies of their directory on CompuServe and The Source. Don't try to run or download their whole list — it is just too many pages. Search for the category or area code or whatever. There is adequate help online to guide you. There are directories on many bulletin boards, but I have not found one that comes

---

(Randy Graham is a rehabilitation counselor working with the handicapped. Personal computing is his hobby; telecommunications, one of his favorite activities. He has done freelance information retrieval and is an inveterate user of the major online systems.)

close to PMS's for completeness and maintenance. Novation, the modem people, used to have a bulletin board with a comprehensive list, but they seemed to have moved since the last time I called them.

On a more professional and commercial level, Dialog is offering *A Database of Databases*. This is a logical step in this rapidly growing field. They have 2,500 listings that give name, source, coverage, availability, costs, etc. This is a valuable and long-needed resource to online searchers.

> ". . . PCM is sponsoring a special interest group called 'MSDOS' for users of MS-DOS-based machines."

A New "Magazine"

Back to the subject of lead time in publishing for a moment: can we cut it further with online publishing? Several groups are trying. The Source is now offering *Newsbytes* as a weekly newsletter of computer news. And *IF Magazine* is still online in California as a monthly electronic magazine open to the public for a call to (714) 255-8868. In addition, all the information services have a bulletin section for news about their own operations, and many BBS's have news sections containing mostly material the SysOp has read and typed in for our edification.

A Good Book

I do not want you to think I have abandoned the printed page to spend my life before the pixeled screen, although I admit that I long ago decided that if I tried to read all the books and magazines published about computers, I would have no time left for the computer. Nevertheless, I did run across a good book recently on getting started in the online lifestyle: *Dialing for Data* by David Chandler (New York, Random House, 1984; $9.95). There are a number of such introductions on the market, but I just liked this man's style of writing. If I had gotten around to writing a book, I hope it would have come across as well as his.

Chapter Two

Last month, I mentioned Delphi's new Tandy users group which is supporting the 1000, 1200 and 2000. As you might already know, PCM is sponsoring a special interest group called "MSDOS" for users of MS-DOS-based machines. (See "Lprint" for more information.) They have a separate SIG supporting the portables; there are also portable SIGs on The Source and CompuServe.

If you are reading this on the plane bound for Princeton, look around for my name tag at PCMfest and say hello. I will be the one with the Model 100 (the grown man's teddy bear) under my arm. PCM

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Last month we discussed the first part of a mini-course in assembly language using the assembler in Debug. This month we'll continue in our effort to give you the rudiments of assembly language and assembly language interfacing to BASIC in 8,000 words or less. But before we go on, we should fill in some gaps that were missing in our earlier discussion . . .

Using Assembly Language on the Tandy PCs

By William Barden, Jr.
PCM Contributing Editor

In the previous examples, we were working with 16-bit registers, usually AX, BX, CX and DX. However, each of these registers can be used as two 8-bit registers, as shown in Figure 1. The upper eight bits of the registers are designated the "high" register and the lower eight bits of the registers are designated the "low" register. AX, then, becomes AH and AL; BX becomes BH and BL; CX becomes CH and CL and DX becomes DH and DL. The other 8088 registers, however, remain only as 16-bit registers. Most arithmetic and logical instructions can use either 16-bit registers or the eight 8-bit registers. We could, for example, add a value of 20 to the AH register by the command `add ah,20`.

Major Instruction Groups

We discussed arithmetic instructions such as ADDs and SUBs last month and also looked at both unconditional and conditional jumps. Now let's look at some of the other instruction groups. The ones we'll describe constitute 90 percent of the instructions you'll typically use in your own assembly language programs.

Logical instructions: The logical instructions perform the same operations as BASIC ANDs and ORs and exclusive ORs. In format they look very much like the arithmetic instructions. The AND performs a logical AND on an operand:

```
and al,3
```

If the AL register contained 00010111 and the AND above was executed, the result would be

```
      00010110
AND   00000011
      --------
      00000010
```

The result of the AND is done on a bit-by-bit basis, with a result bit being set only if both operand bits are a 1. The AND is used to "mask" out fields within eight or 16 bits.

An `or al,3` would perform a second

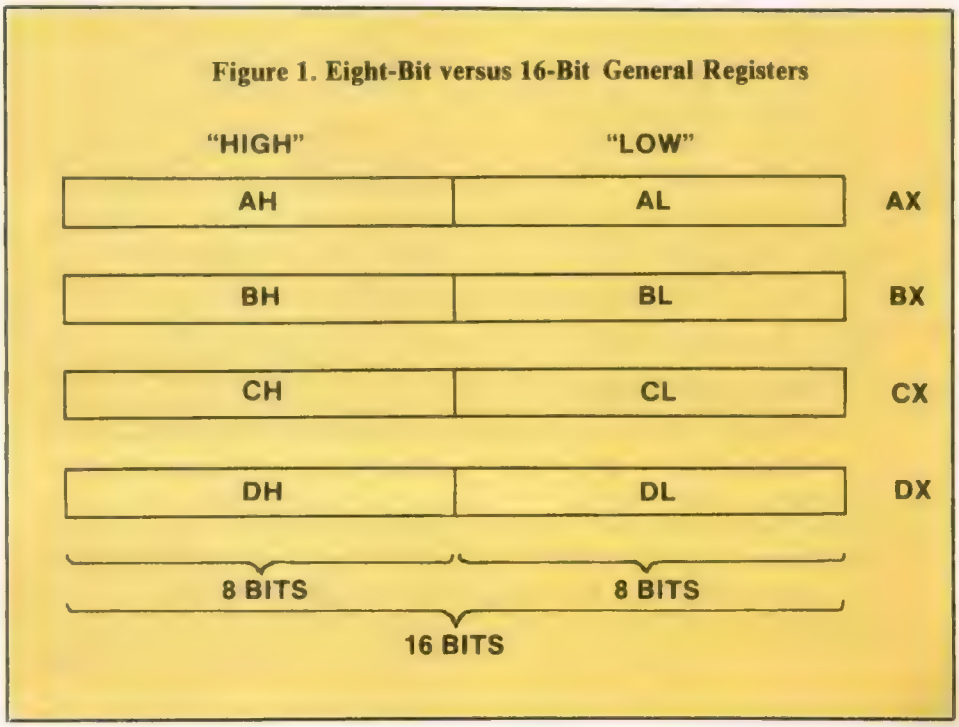

Figure 1. Eight-Bit versus 16-Bit General Registers

(William Barden, Jr. is a master communicator in a field in which he is one of the few recognized experts — microcomputers. A prolific author of more than 27 books and handbooks on computers and computer programming, Bill also has authored several instructional software projects for Tandy/Radio Shack.)

type of logical operation:

```
    00010110
OR  00000011
    --------
    00010111
```

Here, a result bit is set if *either* operand bit is a 1.

The exclusive OR sets a result bit if one, but not both operand bits, is a 1:

```
    00010110
XOR 00000011
    --------
    00010101
```

Shift and Rotate Instructions: The shift and rotate instructions are used to shift data one or more bits at a time. To see how they work, assemble the following code:

```
-a 0100
0930:0100 mov ax,1234
0930:0103 mov bx,1234
0930:0106 mov cx,ffff
0930:0109 mov dx,8000
0930:010C rol ax,1
0930:010E ror bx,1
0930:0110 shl cx,1
0930:0112 shr dx,1
0930:0114 jmp 10c
0930:0116 ENTER
```

You can now see the effect of the shifting by a Debug command called Trace. Trace acts like a G (Go) but stops after a specified number of instructions are executed. For example, to execute 16 instructions starting at location 0100, you'd do:

```
-t=0100 10
```

For each instruction executed, the registers are displayed as if an R command had been executed. Execute a series of Trace commands and watch each register in turn. The ROL and ROR instructions rotate data in the registers to the left or right. At the end of 16 rotations, the data is restored to its initial status. The SHL and SHR instructions shift data to the left or right, with zeros being placed into the opposite ends to fill vacated bit positions. At the end of 16 shifts, the entire register has been zeroed. Either 8-bit or 16-bit registers *or memory locations* can be rotated or shifted.

To continue tracing from the last instruction, do a -t 10.

Another type of shift is an arithmetic shift. In this type of shift, the sign bit is *sign extended* to the right as the data is shifted. Here's an example:

```
-a 0100
0930:0100 mov ax,8000
0930:0103 sar ax,1
0930:0106 jmp 0103
```

In this example, the initial contents of the AX register is Hex 8000 or decimal -32768. After the first shift, the AX register contains C000, or decimal -16384. After the second shift, the AX register contains E000 or -8192. This sign extension continues until the AX register holds FFFF, or -1. There is only one arithmetic shift in the 8088, the SAR.

Another form of the shift allows you to shift more than one bit position at a time by specifying a count in the CX register. We'll leave that up to you to try out.

Subroutines: Another group of instructions involves subroutine CALLs. A subroutine is one of many instructions used in a program to eliminate rewriting the code each time the same functions are used. Assembly language subroutine calls are identical to BASIC subroutine GOSUBs in their function. The return point of a subroutine call is stored into the stack. The stack (discussed last month) is a special area of memory set aside for return addresses, temporary user data, and interrupt return points and data. At the end of the subroutine a RET (similar to a BASIC RETURN) is used to retrieve the address from the stack and automatically make the return. Like BASIC, assembly language subroutines can be "nested" to any level.

```
-a
0930:0100 call 0105
0930:0103 jmp 100
0930:0105 call 10b
0930:0108 inc ah
0930:010A ret
0930:010B dec al
0930:010D ret
0930:010E ENTER
```

The code above has two nested subroutines, one at 105 through 10A and the second at 10B through 10D. The first increments the AH register by one count and the second decrements the AL register by one count. Use a Trace command to execute 20 instructions starting at location 0100 to see the action — AH will count up while AL will count down. (AH and AL are part of AX, and are not displayed separately.)

To see what happens in the stack, try this:

First observe the contents of the SS register and SP register. Remember that together they point to the "stack" in memory that holds subroutine return addresses and temporary data. In my system the SS register holds 0930 and the SP holds FFA4 before execution of the code.

Now execute by a -t=0100 3.

This executes the CALL 0105, followed by the CALL 10B, followed by the DEC AL.

At this point, look at the SS and SP registers again. What you will see is that SS is the same but that SP is set to a value four bytes lower than it was initially. In my case, this was FFA4. This reflects the current address of the "top of stack." Remember that the stack builds down. We can take a look at the stack by using another Debug instruction called D (Dump). Dump displays a block of data at one time. To display from 0930:FFA4, do -d 0930:FFA4.

What you'll see will be something like the display in Figure 2.

The Xs here represent "don't care data." Initially the SP was set to FFA8. However, when the first call to 0105 was done, the return address of 0103 was "pushed" onto the stack and the SP was then adjusted to FFA6. This was followed by a call to 0108, and the return address of 0108 was pushed onto the stack. After the push, the pointer was set to FFA4. (The "pushes" are all done automatically by the action of the CALL instruction.) The RET instructions "pop" the return addresses off the stack and adjust the SP the other direction. After two RET instructions the SP now stands at what it was initially, FFA8.

The stack is not only used automatically to store return addresses. It can also be used by PUSH and POP instruc-

Figure 2:

```
0930:FFA0             08 01 03 01-XX XX XX XX XX XX XX XX    ............
0930:FFB0 XX XX XX XX XX XX XX XX-XX XX XX XX XX XX XX XX    ................
```

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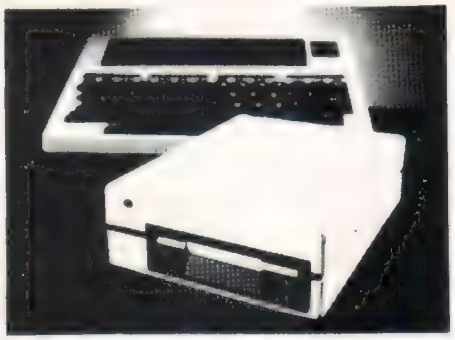

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tions to store register data temporarily. This is often done so that the registers can be used for other purposes. Any data that is stored, however, must be retrieved, or at least the SP must be set to the initial value. Here's an example of a storage of AX and BX and a later retrieval:

```
push ax
push bx
.
.
pop bx
pop ax
```

Note that the registers are restored in the reverse manner from which data was stored. As a point of fact, however, data does not have to be restored in the same registers, or even restored at all, as long as the SP is set back to what is was initially.

Other 8088 Instructions

We've covered a large number of instructions above, but haven't touched on a number of the more interesting instructions in the 8088, such as the multiply, divide and string processing instructions. We'll cover some additional instructions in the remainder of this column, but can't describe every instruction. One thing that will be indispensable is a good reference book on 8088 assembly language. Probably the best place to start is to look at publications by Intel, the manufacturer of the 8088. Technical book stores may have the Intel "iAPX 88 Book," which provides a detailed breakdown of the 8088 instruction set. Books by other authors range from fair to excellent. The IBM *Macro Assembler* or equivalent Radio Shack documentation is also helpful, but is bundled with the software, and you may not choose to make the investment at this time.

Application Examples

We now have a little knowledge of assembly language and should be well prepared to create chaos on Tandy 1000s, 1200s or 2000s. In all seriousness, however, there's not too much trouble we can get into. If the system "locks up" and you can't get back to Debug, just reload and start again. We'll also show you how to save a memory image on disk so you will be able to restore longer programs without having to reenter everything from scratch. We'll consider two programs here. Program 1 will change all uppercase characters to lowercase characters. Program 2 will fill the display screen with any given character.

Program One: Uppercase to Lowercase

Like any programming problem, the first step is to do some thinking about what's involved. Uppercase and lowercase characters are both represented in PC compatibles by ASCII codes. The ASCII codes for uppercase 'A' through 'Z' are 65 (decimal) through 90 (decimal), while lowercase 'a' through 'z' are 97 (decimal) through 122 (decimal). We'll assume that we're given an address of a text string of a given length. Since this assembly language code will probably interface to BASIC, we'll assume that the text string will be no longer than 255 characters. The address could be anywhere within the BASIC segment, so we'll need a 16-bit address value that points to the beginning of the text string. The process would appear to involve "scanning" a text string from beginning to end, looking at each character to see whether it is an uppercase character. If it is, we'll change it to the corresponding lowercase character by setting bit 5 of the character. An 'I' Hex value of 49, for example, binary 01001001, can be changed to lowercase by setting bit 5 — 01101001.

By the way, this is not something that an experienced assembly language programmer can immediately sit down and crank out. He'd have to do some head scratching first, just as we're doing.

My first programming attempt produced this:

```
-a0100
0930:0100 cmp si,di
0930:0102 je 115
0930:0104 mov al,[si]
0930:0106 cmp al,40
0930:0108 jle 112
0930:010A cmp al,5a
0930:010C jg 112
0930:010E or al,20
0930:0110 mov [si],al
0930:0112 inc si
0930:0113 jmp 100
0930:0115 ENTER
```

One thing that you might notice in entering the address for the JMPS is that you don't know beforehand what the addresses will be. For example, when entering JE at 0102, you don't know at that point that the ending point of the program is at address 115 because you haven't entered all of the instructions and Debug has not computed the instruction lengths. In these cases, simply put in a "dummy" address, such as 1FF, and then go back with a single location A to enter the correct address after all of the instructions have been entered.

Let's look at the program in detail. The program assumes that the starting address of the text string will be in the SI register and the ending address of the string will be in the DI register. SI and DI are typically used to hold addresses in this fashion. We'll see why in a moment.

The CMP instruction compares the contents of SI and DI. If they are the same, the last byte (character) of the string has been reached then the program ends with a jump (JE) to location 115. Location 115 has no instruction, but we'll just breakpoint there for the time being.

If the contents of SI and DI are not equal, then there are more characters to process. The "current" character is moved into the AL register by MOV AL,[SI]. This instruction uses the SI register as an "index register" that points to the next character. Remember that SI contained the starting address upon entry into the program. SI will be incremented by one as each character is tested. The MOV AL,[SI] form of the instruction loads the AL register with the character pointed to by the SI register.

With the current character in AL, the next step is to see if the character falls between 40 and 5A (Hex). Two compare/conditional jump combinations are used for this. The first tests for AL less than or equal to 40 and jumps to location 112 if so. In this case the character is not an uppercase text character. The next tests for AL greater than 5A. If this condition exists, the character is a higher value than an uppercase text character and a jump is made to location 112 again.

At 10E, the character in AL must be within the range of 41 through 5A, an uppercase text character. The OR AL,20 instruction ORs the contents of AL with the Hex value 20 (binary 00100000), setting bit 5 and converting the character from uppercase to lowercase. The character is then stored back to memory by using the SI register contents as a pointer once more. SI at this point has not changed. The next instruction is executed in all cases. It increments the contents of SI by one to point to the next character. An unconditional Jmp is then made back to the beginning of the program. The tests are repeated for every character in the string.

How can we test this program? Almost every program requires some testing and the testing usually takes as much time as writing the program in the

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first place. In this case, the testing will take even longer. Let's start out with a single byte of test data in an unused location, say location 0120, to keep the data away from breakpoints and the program. We'll put an uppercase 'A' into location 0120 by this command:

```
-e 0120 "A"
```

This Debug command enters an 'A' into location 0120 which we can verify by a Dump:

```
-d 0120
```

Now we'll use the R command to change the SI and DI registers to point to 0120:

```
-r si
SI 0000
:0120
-r di
DI 0000
:0120
```

At this point we should be set to go. A quick check of the registers by another R command verifies that SI and DI contain 0120. We'll execute at 0100 and breakpoint at 0115:

```
-g=0100 0115
```

After reaching the breakpoint, however, we've found that location 0120 still contains an uppercase 'A' rather than a lowercase 'a' as we expected. What's wrong? A little more head scratching uncovers this fact: The comparison of SI and DI in the first instruction immediately terminates the program! The JMP instruction should have been JG, or JMP if SI was greater than DI. Making the change, we now have:

```
0930:0100 cmp si,di
0930:0102 jg 115
0930:0104 mov al,[si]
0930:0106 cmp al,40
0930:0108 jle 112
0930:010A cmp al,5a
0930:010C jg 112
0930:010E or al,20
0930:0110 mov [si],al
0930:0112 inc si
0930:0113 jmp 100
0930:0115 ENTER
```

Now reset the SI register to 120 and execute. This time execution reveals a 61 Hex in location 0120, equivalent to an ASCII 'a'. Heady with success, we use the Debug E command to create a string of characters:

```
-e 0120 "NOW IS THE TIME"
```

The SI and DI registers are then set for the new string:

```
-r si
SI 0000
:0120
-r di
DI 0000
:012e
```

After a check of the registers by R, we execute again. This time a d120 reveals that the data in the 120 area has been set to "now is the time." One more test might be nice, a test to see that no data is changed when it shouldn't be. E is used again to enter data that should not be changed:

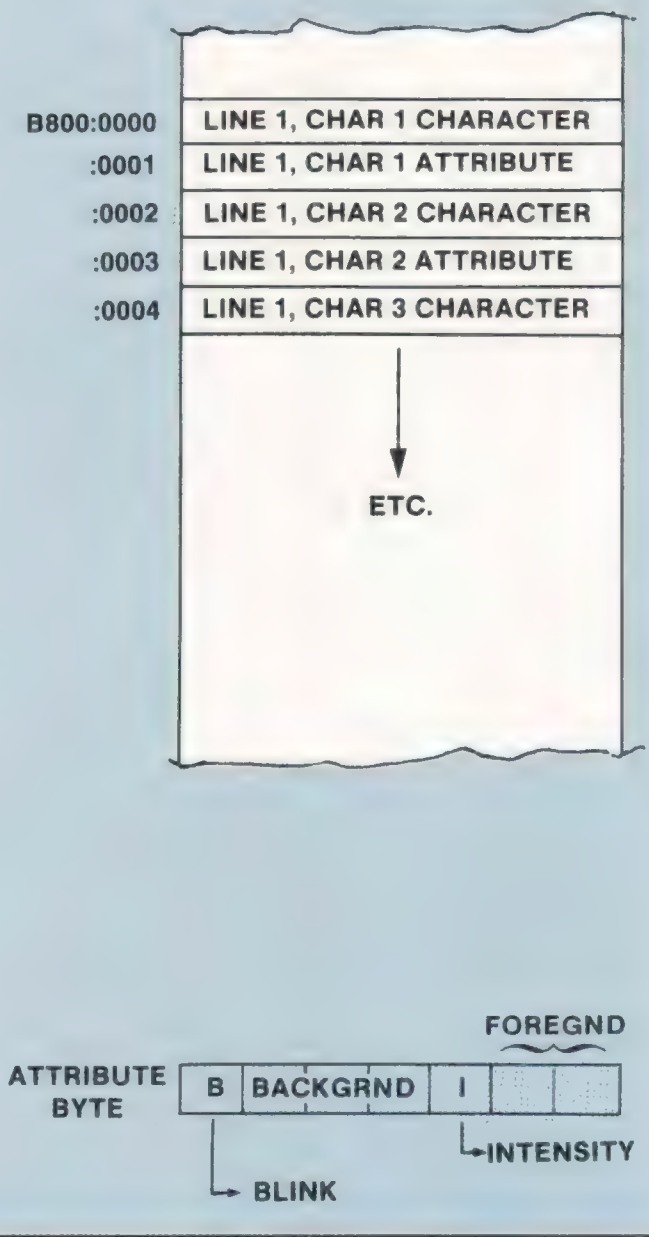
```
-e 0120 "asdf1234#$%"
```

A check after execution reveals that this data has not changed. At this point we can say that the program appears to be working. However, there may still be bugs lurking within!

Program Two: Fill the Display Screen With a Given Character

The next program we'll consider is a program to fill the display screen with a given character. As in the first program, we'll need to do a little thinking about the design of the program before beginning. The display screen for a color graphics display is located at absolute memory address B8000, as shown in Figure 3. Each character

Figure 3. Text Mode for Color Graphics



position in text mode is made up of two bytes, the actual ASCII character displayed and an "attribute" byte. The attribute byte controls blinking, foreground color, and background color as shown in the figure. To fill the screen with a given character, then, means writing the character to every even-numbered byte starting from B8000 and ending 2,000 bytes later, in 80-character mode (25 lines at 80 characters is 2,000 characters). Each attribute byte should probably also be set to some reasonable value. We'll use a value of 15 decimal for a normal text display. See Figure 3.

The main problem here is how to address the B8000 area. We know that we can address 64K bytes within a current segment, but how do we address another segment? One way to do it is to use the ES, or extra segment register. If we set that to B800, we'll be addressing the start of the video display memory.

Our first rough attempt at this problem produces:

```
-a 0100
0930:0100 mov bx,b800
0930:0103 mov es,bx
0930:0105 mov cx,7D0
0930:0108 mov al,15
0930:010A mov si,0
0930:010D es:mov [si],ah
0930:0110 es:mov [si+1],al
0930:0114 add si,2
0930:0117 dec cx
0930:0118 jnz 10d
0930:011A ENTER
```

Let's look at this code in detail. First, we've made the assumption that the character to be stored is in the AH register. AL will hold the value to be put into the attribute byte. The ES register is loaded with the value B800 by first loading the AX register and then transferring the value. The CX register is then loaded with a count of 2000 (7D0 in Hex), representing the 2,000 characters that must be transferred. The AL register is loaded with the attribute value. The SI register is used as an index register in the same fashion as in the preceding example. The 0 represents an offset of 0; it will be incremented during the transfer of data.

The main loop of this program is at 10D through 118. Each time through the loop, the character to be displayed is stored from AH, and the attribute byte is stored from AL. A MOV accomplishes both stores. The first store is to the offset pointed to by SI. The next store is to the offset+1. The ES: mnemonic is called a *segment override* mnemonic. It tells the 8088 that the following instruction will reference the ES segment, rather than the DS segment as would be done without the override.

The ADD instruction adds 2 to the SI register to point to the next two bytes, the character and attribute bytes. The CX register is decremented by one. When CX is decremented down to zero, 2,000 stores of the character and attribute byte will have been done, and the program is over. If 2,000 stores have not been done, however, the program continues by the JNZ 10D.

Before executing this program, we must put the character to be stored in AH. This can be done by

```
-r ax
AX 0000
:4100
```

Note that the AX register must be specified. It's not possible to fill only one half of the AX register by AH or AL.

Now a Go can be executed with a breakpoint at 011A:

```
-g=100 11a
```

Sure enough, as in most assembly language programs, the code did not work the first time. I got a washed out set of A's on my black and white display. A little investigation turned up the fact that the AL was loaded not with 15 decimal, but with 15 Hex as in the code above. Change the line to

```
mov al,f
```

and the program will work.

Saving and Reading Programs From Disk

Three more Debug commands may prove extremely helpful. It is possible to save a *core image* of the assembly language code and data you've entered by first *naming* a file by the N command:

```
-n alnum1.dat
```

Next, the number of bytes to be written must be loaded into BX and CX:

```
-r bx
BX B800
:100
-r cx
CX 0000
:100
```

We've used 100 bytes (256 bytes decimal) here as an arbitrary value, but you should use a value dependent upon the program size. Finally, the address of the start of the data is specified in a Write command. If no address is specified, the data will be written out from location 0100.

```
-w
```

When the write is being done, you'll see the message

```
Writing 100 bytes (this example)
```

Thereafter, to load in the file containing the data, just do an L command:

```
-l
```

(If you are loading in the file initially, however, you must first specify a file name by using an N command.)

Interfacing To BASIC

All of the above is well and good, but what do you do with the assembly language program once you have it? One excellent idea is to interface it to BASIC. That way BASIC and assembly language can work together, BASIC providing the input and output formatting, and assembly language providing the high-speed processing for those time-critical functions such as sorting and string processing.

Let's see how this is done by taking one of the two application examples above and using it with a BASIC "driver." We'll choose the screen display.

First, we must determine the memory in which the assembly language program is to reside. BASIC operates in a 64K segment as shown in Figure 3. The top of this segment can be "protected," or reserved for assembly language, by loading basic with the /M switch. An example is

```
A>BASICA /M:60000
```

which reserves offset locations 60000 up 65535 in the BASIC segment for assembly language subroutines. Anything put in these locations will not be touched by BASIC as it uses its stack and string storage area. A similar command is CLEAR, 60000 from within a BASIC program.

If you have a system with minimum memory, by the way, you'll probably have to use a much smaller value for this protected area, as there may not be that much memory left over by the time BASIC, video graphics areas, and so forth are loaded. For that reason, we'll use a value of 25000 in the following,

allowing the program to run on 128K Tandy 1000 systems.

The next requirement is to move the assembly language code into the protected area. One convenient way to do this is to store the machine language code in the form of data statements with the &H prefix. Before we do that, though, we've got to modify our code slightly to enable *parameters* to be passed from BASIC to assembly language. (In other cases, parameters may be passed back the other way, or in both directions.)

Here's the modified program, reentered from Debug:

```
-a 0100
0930:0100 db 0
0930:0101 push es
0930:0102 mov ah,[61a8]
0930:0106 mov bx,b800
0930:0109 mov es,bx
0930:010B mov cx,7D0
0930:010E mov al,f
0930:0110 mov si,0
0930:0113 es:mov [si],ah
0930:0116 es:mov [si+1],al
0930:011A add si,2
0930:011D dec cx
0930:011E jnz 113
0930:0120 pop es
0930:0121 retf
0930:0122 ENTER
```

The first added here was a DB pseudo-op before the code. The DB operates much like the DW, except that it reserves one byte per argument. The second thing added was a PUSH ES to save the contents of the ES register in the stack for the return to BASIC. All segment registers must be restored when the assembly language code returns to BASIC. The next change was MOV AH,[61A8]. This instruction moves the data from location 61A8 (25000 decimal) into the AH register. Recall that AH holds the byte to be stored on entry. The POP ES restores the contents of ES before the return to BASIC. The last thing added was an RETF instruction so that the assembly language code becomes a true subroutine. The RETF here is different from the normal RET used in Debug; it's a "Far" Return, indicating that both the CS register and offset address must be retrieved from the stack. The call from BASIC was located out of the BASIC data segment and was a corresponding "Far" call that changed the CS register in addition to specifying an offset within the new code segment.

The next step is to Dump the machine language from Debug so that we can see what bytes to store in the BASIC DATA statements. The relevent portion of the Dump looks like Figure 4.

We can now put the code into BASIC DATA statements as in Figure 5.

When this program is executed, you will see data appearing so fast on the entire screen that you won't be able to make out individual characters. Contrast this with the speed of BASIC!

The CALL Statement

The CALL statement in BASIC actually transfers control to the assembly language code. Normally the CALL can be used with any number of parameters. The parameters are passed to the assembly language program via the stack, which both BASIC and the assembly language code share. Here, though, we've used a "parameterless" CALL that simply calls the assembly language code. We've passed the parameter by defining the first location of the assembly language program as a mutually agreed upon location to hold the character to be displayed. The CALL actually calls the assembly language code one byte after the parameter. If this were not done, the 8088 would attempt to execute the parameter value, which would probably be a garbage instruction.

Position Independent Code

A word of warning is in order. Not *all* Debug assembled programs will be able to be incorporated into BASIC statements as we did here. If you use constants inside the program and MOV them with absolute addresses, those addresses will be wrong when BASIC executes the assembly language program. Here's an example of what we mean:

```
0930:0105 mov ax,010A
0930:0108 jmp 0100
0930:010A db 23
```

The MOV AX,010A assembles as B80901, with the 0901 representing an absolute offset within the current code segment. This offset will be different when the program is loaded into the BASIC data area. Conditional and unconditional jumps are "position independent," however, as they assemble relative to their location and do not include absolute addresses for jumps that are close. There are tricks to get around this limitation, but that's another column.

In Summation

In 8,000 words, we've touched on assembly language in the Tandy 1000, 1200HD and 2000, but left out a great deal of material! I hope this has given you the flavor of what's involved, however. It is definitely not for the casual *Lotus 1-2-3* user, but can be very rewarding if you're willing to spend the time in training. I am currently finishing a complete course with text and software for assembly language on the Tandy 1000, 1200HD and 2000. For more information, write me at P.O. Box 3568, Mission Viejo, CA 92692. Next time we'll be back with less esoteric topics, perhaps describing in detail how to turn on your system and set the clock. PCM

Figure 4:

```
-d100
0930:0100 00 06 8A 26 A8 61 8B 00 B8 8E C3 B9 D0 07 B0 0F
0930:0110 BE 00 00 26 88 24 26 88 44 01 83 C6 02 49 75 F3
0930:0120 07 CB
```

Figure 5:

```
90 CLEAR ,25000
100 DATA &H00,&H06,&H8A,&H26,&HA8,&H61,&H8B,&H00
110 DATA &H88,&H8E,&HC3,&HB9,&HD0,&H07,&HB0,&H0F
120 DATA &HBE,&H00,&H00,&H26,&H88,&H24,&H26,&H88
130 DATA &H44,&H01,&H83,&HC6,&H02,&H49,&H75,&HF3
135 DATA &H07,&HCB
140 FOR I=0 TO 33:READ A: POKE 25000+I,A: NEXT I: ALSUB=25001
150 B=INT(256*RND(1)): POKE 25000,B: CALL ALSUB
160 GOTO 150
```

Palette Animation

With Wayne Sanders, Curator

This month's featured exhibit is the work of William Fronek of Houston, Texas.

The program, called WAVE.BAS, simulates computer animation with clever use of BASIC's PALETTE command. It runs on either a Tandy 1000 or a Tandy 2000 with graphics. If you will be using it on a Tandy 2000, change the first line to read 1000 MODEL=2000.

If you have a creation you'd like to see presented here, by all means, send it in. A winning gallery exhibit is chosen each month, and the "artist" is awarded $50. Address your entries to Wayne Sanders, PCM Gallery, P.O. Box 385, Prospect, KY 40059. You might find it well worth the effort!

The listing:

```
1000 MODEL=1000
1010 IF MODEL=1000 THEN CLEAR ,,,32768!:CLS:KEY OFF:SCREEN 5:R=.5
1020 IF MODEL=2000 THEN CLS:KEY OFF:SCREEN 3:R=1
1030 C=1
1040 FOR I=10 TO 150 STEP .3
1050    Y=200-195*SIN(I)
1060    X=10+I*4
1070    CIRCLE (X*R,Y*R),4*R,C
1080    PAINT (X*R,Y*R),C
1090    C=C+1:IF C>7 THEN C=1
1100 NEXT
1110 FOR C=1 TO 7
1120    PALETTE C,12
1130    FOR T=1 TO 120:NEXT
1140    PALETTE C,0
1150 NEXT
1160 GOTO 1110
```

PCM introduces a new monthly column that helps you put Tandy's DeskMate *to work*

The Integrated Desk

By Bobby Ballard

Welcome to PCM's new *DeskMate* column. You will find important information and interesting tidbits here each month to help you get the most from your *DeskMate* software. I'm excited to bring you this column and I think you will find it useful whether you're a beginner or an advanced computer user.

As you may know, Tandy distributes *DeskMate* with every new Tandy 1000 and 4D. Versions are available for other models, such as the 1200, 2000, Model 4/4P and Color Computer. I will concentrate in this column on the MS-DOS versions of *DeskMate* for the 1000, 1200 and 2000; especially the 1000 since everyone receives a copy of *DeskMate*.

I encourage you to write me with your problems, suggestions or questions about *DeskMate*. Let's face it, no manual completely covers all the subjects or questions a person may have with a particular piece of software, and *DeskMate* is no exception. And in this case, an integrated package, there can be many questions about each feature. So, don't hesitate to write and share your thoughts or problems.

(Bobby Ballard is a free-lance writer and the owner of a computer software and consulting firm. He also operates a BBS in Brooklyn. Bobby can be contacted at 1207 Eighth Avenue, Apt. 4R, Brooklyn, NY 11215.)

Integrated Versus Dedicated

DeskMate might have been your first experience with an integrated software package. If so, let me help you get a grasp on the difference between integrated and dedicated software and what they mean to your productivity. After all, you bought your computer to be more productive, right?

When you see the term integrated software, it can sometimes have various connotations. Most of the time though the term is applied to progams that combine features traditionally found in separate packages. In the past, if you wanted to process words, you bought a word processor or editor of some type and used it for just that task. Then, if you needed to file some information, you would load a database program, set up your files for whatever type of data you needed to keep track of and then file it. There are many historical reasons for the separation of these tasks, but the main one is memory capacity. These separate but equally powerful programs are known as dedicated applications.

As the industry moved toward more memory at lower cost, programmers were given the ability to combine different features in one program and to make those features interactive. In the past, you might not have been able to combine a letter with your files unless the two programs could "talk" to each other or you bought a program to make them interactive. This combining of features is known as integrated soft-

ware, and that's the category into which *DeskMate* falls.

DeskMate packs many features and a lot of power for the money spent. Although the names have been changed, the tasks are essentially the same. You get a word processor in the "Text" section to handle your writing needs. The "Worksheet" section is a 99 by 99-cell spreadsheet for performing complex calculations and "what if" functions. "Filer" is a database manager that will not only keep track of your data, but allow you to combine your data with the "Text" feature using a merge function. The "Telecom" feature is a telecommunications package that handles dialing the phone, "auto-logs" and the protocol settings for using a modem to send and receive data over the phone lines. The "Calendar" feature provides time management software that works with the "Alarm" feature to warn you before the event is about to happen. The "Mail" feature provides a way of receiving files over the phone lines while leaving your computer unattended. This works in conjunction with the "Host" mode found on the single-line menu at the bottom of the main menu.

In addition, *DeskMate* provides a simple calculator, on-screen help files, an alarm file editor, voice phone dialing, data and time functions and printer settings modification. Each month I'll cover one of the many and varied features found in *DeskMate*, weed through the manuals and help files and pass on tips that *you* have found and sent in to share with others.

"While you may be able to write a letter, merge it with a spreadsheet and then send it out over the phone lines to others, you will find trade-offs for the convenience."

You must remember that integration has its drawbacks. While you may be able to write a letter, merge it with a spreadsheet and then send it out over the phone lines to others, you will find trade-offs for the convenience. What are those trade-offs? Let's take a look.

The first obvious drawback is the size of the files with which you can work. For example, when you go to download using the "Telecom" feature, you will be limited by the size of the buffer you have in which to capture data. With *DeskMate*, the buffer is only 17K or about 17,000 bytes. Each character received takes a byte so your files will have to be no longer than several pages of single-spaced data. Some quick calculations reveal the details. If the average word in the English language is five characters in length, and you allow for control characters as well, you can only download about 3,000 to 3,400 words. At 1200 Baud you receive about 24 words a second. At that rate you will fill your buffer in about two and a half minutes. At 300 Baud you will fill your buffer in just under 10 minutes.

A second drawback is limited features. You will notice, especially if you've worked with other software, that many features of dedicated programs are not found in *DeskMate* applications. To give another example, the word processor in *DeskMate* does not

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have global search and replace or a spelling checker, and the scrolling becomes slower the fuller the buffer gets. These are small trade-offs to be able to compose mail and send it over the phone lines or merge letters with spreadsheets and files, but these trade-offs may be limitations you can't live with and will want to buy dedicated software for some of your applications.

I point out these things not to degrade *DeskMate*, but, to give you an idea of why some features work the way they do. I think that no matter why you bought a computer, you will still find a task that *DeskMate* will handle excellently. While I use my 1000 mostly for word processing and programming, and the "Text" feature doesn't contain all the features I need, I still find the spreadsheet as well as the Calculator and Filer meet most of my needs, and I make heavy use of the "Calendar" feature. In addition, I consistently log on to CompuServe, Delphi and the other databases using the "Telecom" function.

The above leads me to the major advantage of *DeskMate* and integrated software. With one purchase, you get the major applications needed to get a day's work done efficiently. In other words, you get the tools needed to increase your productivity. It would be an expensive proposition to buy all the dedicated software needed to achieve the variety of tasks that *DeskMate* makes available. Imagine the cost of buying a word processor, spreadsheet, telecommunications package, calculator, database and the others that make up *DeskMate*. You would need hundreds of dollars — and some new shelves for all the manuals.

DeskMate allows you to get a grasp on your own needs beyond the tasks you may already be planning to perform. While you may have bought a computer to write or perform calculations, it would be a shame to exclude yourself from the other tasks a computer can perform because of the high cost of dedicated software. With *DeskMate*, you can perform those other tasks without the extra expense.

Additionally, you can find out more about what a computer can do and the features you need in your dedicated programs before you buy. I know many people who bought a computer to use for one specific task, but when they got an integrated package or talked with friends, they found they could perform tasks that were valuable to them and valuable to making better use of their machine. For example, you can log on to a BBS or information utility and find out how to make better use of *Lotus 1-2-3* without having to spend several hundred dollars for a dedicated telecommunications program.

To sum it up, each section of *DeskMate* has something to offer everyone. Don't look at what *DeskMate* can't do with your specific needs but how *DeskMate* can add to your overall computer power and productivity.

If you're like I am, you bought a computer to run a particular piece of software, and now you've found that it can do much more than you planned. *DeskMate* will give you an idea of what you can achieve with your computer. So, if you find that you would like to know more about spreadsheets or telecommunication or any other feature of *DeskMate*, just stick with PCM and this column. We're going to cover the whole range of possibilities using *DeskMate* from word processing to auto-dialing and using your computer to host other computers. I'll cover the technical as well as the general aspects of *DeskMate* and try to answer your questions, pass on tips from other readers and put *DeskMate* through the paces. Just as *DeskMate* is an integrated software package, we'll integrate many subjects right here in PCM. PCM

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This BASIC program turns your Model 100 into a BBS host

Host Your Own Network with Your Model 100

By Chuck Buchanan

"You're joking! Run a BBS on a Model 100? Who ever heard of such an idea!"

Those are the initial reactions of most people in Spokane until told that for the last nine months I've been running a very successful BBS on a 24K Model 100 in conjunction with an auto-answer modem and a separate phone line. It's a fantastic way to keep in touch with friends and associates and not have to play "telephone tag" with one another in order to do it!

The Model 100 has to be the most capable and dynamic little computer to come down the pike in a long, long time; it is only natural that it be considered for a BBS system! This article will describe just how to go about setting up *your* system. As for me, all I can say is that telecomputing has become so easy and so much fun that I've had to buy a *second* Model 100 for general use, and I am now using the first one exclusively for full-time BBS operations. So beware!

(Chuck Buchanan is a self-admitted "computer addict" who uses micros in both work-related contracts management and hobby applications. He developed a passion for programming in BASIC with his first computer [a Color Computer] four years ago.)

What It Is

The network, called "SoftMail," is a full-featured BBS that allows up to 30 members to "message" each other day and night. It features full password access and message privacy; while new callers may simply enter NEW as the password and be directed to an area where they may leave an inquiry, regular members have three tries to give their own private password in order to log on.

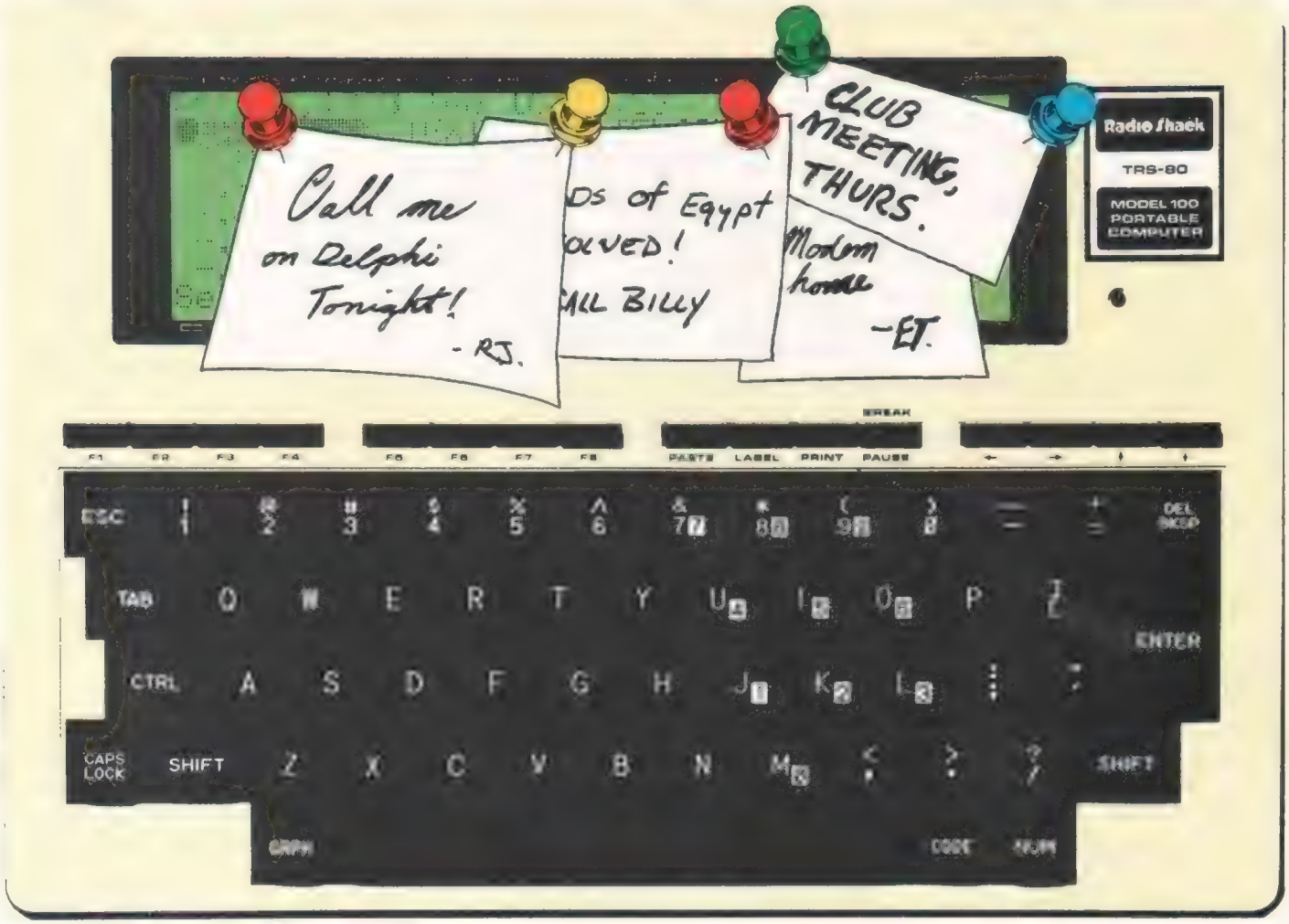
Once successfully "in," callers have the ability to check for messages, to review the address list, to edit and send messages (with automatic line wrap), to receive mail, to page and enter a "chat mode" with the SysOp (that's *you*, the system operator) while online and to log off with an accounting of how long they were connected. A help feature is also included, which will use the text file you may write and place in RAM as ALL01Z.DO.

The menus within SoftMail are easy, self-explanatory and only require touch selection. For the SysOp, there are extra features. Four function keys allow him or her to enter chat mode at any time with the caller, interrupt program execution and give a "host off" message, provide a warning that the system will go down in two minutes and simply have the screen show who is online.

SoftMail keeps a full record of who called, the date and time, how long they were online and what messages they retrieved, sent and deleted. This record, called SYSDFZ.DO, can be reviewed remotely by the SysOp. In addition, the program features full error trapping and will even "kick" persistent error makers off the system!

During menu input, SoftMail will convert lowercase to uppercase so that there will be no errors in command or file recognition. In the event of a "sleepy" caller who dawdles more than two minutes without doing anything, the BBS will even hang up automatically and reset itself.

Unlike other remote BBSs, which allow the caller's keyboard to duplicate



the host's console, SoftMail treats external input/output as a remote file, and the BASIC BBS program stays in full control at all times, with the host's LCD screen only showing significant menu selections and input as the caller writes messages.

But It's So Small

Now you ask, why network with a 100?

There are a number of reasons why the 100 is a *perfect* choice:

- Because it has no moving parts to wear out, no disks to replace; all messages (and the hidden log file SYSDF) are maintained in RAM, designated as BBS files by the suffix Z.DO
- By using the INPUT$ command for all input, the system is able to avoid sabotage or interruption through a hostile CTRL-C or BREAK command invoked by a caller.
- The size of the 100 makes it highly suitable for applications which need a full BBS without wanting to have to endure the complexity and size of other systems.
- Because everything is in RAM, it is instantly accessible for review by the SysOp. Responses can be written from the host side by simply using the text program (inserting carriage returns) and labeling the messages with titles that the BBS can recognize.
- Since it is a non-mechanical system, there is no need to fear a "runaway" computer — disk drives smoking into oblivion. Using the IPL feature, the BBS can even survive power outages.
- Finally, it's just plain fun to have so much going on so simply in such a compact little package!

Getting It Together

Type in the program and save it as BBS.BA.

Using IPL, instruct your 100 to execute BBS in case of power interruption. Create a message similar to that in "Message 1" and save it to RAM as ALL01Z.DO. This is the message that will be listed to the caller if he or she selects HLP from the menu. It will also be listed from within the BBS directory (CHK) and may be retrieved in that manner as well.

Be sure to set up your caller and password files in lines 1000 through 1004, being sure to follow the designated format (a two-digit number for the member, one space, the member's name, followed by a comma and then the three-letter password for that member). You may also wish to adjust GOSUB 80 to include the commands your particular modem requires to disconnect the phone when you log off or receive a "denied access" message. Furthermore, Program Line 4 is optional and only serves to initialize a modem; you may want to delete it if you don't need it.

Connect an auto-answer modem to the RS-232 port. Important: set your modem for non-verbose, "quiet" mode with no echo and with auto-answer enabled. Plug everything in and run the

program. After a few seconds, you'll hear a beep, the screen will clear, show the current files, state Awaiting at:, the setup (or reset-up) time, give the current memory space remaining and (once you've had the first caller) show the name of the last person online.

When someone calls (try it) they'll be prompted to press an asterisk (*). This gets things going — the host screen will say BUSY and the four function key options will be displayed. They will then be asked for their password and will be sent to the main menu. A special memory peek technique allows for a review of BBS-related mail. When the caller presses C for checking mail, he or she will be shown the messages that are BBS files.

The program only displays messages (files) with the flag of $$$##Z.DO. BBS messages always follow the format of the left three characters matching the caller's name or initials and the next two characters being digits representing the message number. The caller never sees the Z.DO, as it is always added discretely by the system.

The special log file SYSDFZ.DO is not displayed, but the SysOp always knows it's there, and can retrieve it from a remote location (and erase it to restore memory) at any time. If the thought of a RAM-based log makes you nervous, simply hook up a printer and change Line 11 to:

```
11 OPEN "LPT:" FOR OUTPUT AS 4:
   RETURN
```

The SysOp file symbols are: '#' — who called and when; '<' — messages retrieved; '0' — erased or '>' — sent and '=' — log off with usage time. An nle entry indicates a denied access situation, and time means the caller got disconnected by the BBS due to overdue input. A '?' denotes a BBS error recorded, and a '[' indicates that the program incurred the same error twice and started all over. This will probably only happen if some "clever" caller tries to zap you with a CTRL-Z.

Callers may write to anyone but can only retrieve their own messages or those addressed to "all." The SysOp, however, can retrieve and delete anything. Furthermore, while anyone can originate an "all" message, only the SysOp can delete one.

The edit features of the BBS are fun — play with them! They will allow a line-by-line review, adding a line, editing a portion of a line and deleting a line. Once a person elects to return to the main menu, they are asked if they want to send the message. They may answer either way; if they do not send it immediately, they may go back down to the work desk at a later point and send the message then, or they may start another message.

If you have a Disk/Video Interface, you may wish to expand the BBS to include other services, related programs which could be on disk and chained online. For example, my current BBS features access to any number of Adventure games which callers may dial up and play. □

Message 1, Sample ALL01 help file

```
Welcome to the Model-100 EBBS,
providing 24 Hour/Day Communica-
tions Networking!!

SoftMail is now running on a

        < TRS Model 100 !! >

For MENU Selections you need only
PRESS the KEY; do NOT use <enter>
unless entering Mail Titles or
inputting numbers.

Use Ctrl-S to Stop Display:
Ctrl-Q to Start again. . .

Throughout, the AT Key <@> func-
tions as an ESCAPE Key -

You may press <@> at any prompt
and you will go to the PREVIOUS
Menu. From the Top Menu, the <@>
will log you Off.

Use <Chk> to see if you have any
MAIL; if so, the Title's LEFT 3
Letters will match those of your
Name or Initials.
Enter that plus the two Digits.

Please be sure to Log Off before
hanging up. . .

Happy Telecomputing !!!

Sincerely,

Your Friendly Local SysOp!
```

The listing:

```
1 REM Greetings! (leave this line in) v.
 12ØØa/pcm
2 REM BBS1ØØ Program  <c> 1984 by Chuck
Buchanan, Spokane, WA  5Ø9-624-Ø262 or C
IS 72335,13Ø1
4 CLOSE:CLEAR15ØØ:MAXFILES=4:ONERRORGOTO
6Ø:GOSUB1Ø:GOSUB39:PRINT#1,"AT":GOSUB35:
```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```
PRINT#1,"ATS2=92SØ=2":GOSUB35:GOSUB39:GO
SUB8Ø
5 CLOSE:BEEP:CLEAR15ØØ:POWER CONT:MAXFIL
ES=4:ONERRORGOTO6Ø:GOSUB1Ø:ONKEYGOSUB88,
12Ø,125,128
6 KEYON:DEFINTA-Z:DEFSTRJ,W:DIM W(32),N$
(32),P$(32):MN=1Ø+VAL(RIGHT$(TIME$,2)):G
OTO135
8 IFZD=45ØØTHENERROR6ØELSEZT=PEEK(65414)
:IFZT=ØTHENZD=ZD+1:GOTO8ELSEPRINT"< ";:K
$=INPUT$(1,2):IFK$=CHR$(8)THEN8ELSEZD=Ø:
PRINTK$:IFASC(K$)>96ANDASC(K$)<123THENK$
=CHR$(ASC(K$)-32):RETURNELSERETURN
9 FORZ=1TOLEN(TK$):IFASC(MID$(TK$,Z,1))>
96THENMID$(TK$,Z,1)=CHR$(ASC(MID$(TK$,Z,
1))-32):NEXT:RETURNELSENEXT:RETURN
1Ø GOSUB11:OPEN"COM:38N1E"FOROUTPUTAS1:O
PEN"COM:38N1E"FORINPUTAS2:RETURN
11 OPEN"SYSDFZ.DO"FORAPPENDAS4:RETURN
13 PRINT#1,:PRINT #1,"* press asterisk <
*> to go on":PRINT"< ";:K$=INPUT$(1,2):P
RINTK$:IFK$<>"*"THEN13ELSEPRINT#1,"> Bra
vo !":PRINT#1,:PRINT#1,:RETURN
17 PRINT#1,:PRINT#1,"* select <Y> or <N>
 ";
18 GOSUB8:IFK$="Y"ORK$="N"THENPRINT#1,:P
RINT#1,:RETURNELSE17
2Ø PRINT:PRINT:PRINT"$ "K$" Menu":PRINTS
TRING$(39,95):PRINT:RETURN
25 GOSUB33:PRINT#4,"# "LEFT$(UI$,3)" "DA
Y$" "LEFT$(TIME$,5):RETURN
26 PRINT#4,"< "EB$:RETURN
27 PRINT#4,"> "ID$:ID$="":DE=DE+1:RETURN
28 PRINT#4,"Ø "EB$:DE=DE-1:RETURN
29 PRINT#4,"- "LEFT$(UI$,3)"-"K$" "LEFT$
(DATE$,5)"  "MM(3):RETURN
3Ø PRINT#1,STRING$(31,61):RETURN
32 PRINT#1,STRING$(31,95):RETURN
33 PRINT#1,CHR$(7):RETURN
35 FORZ=1TO3ØØ:NEXT:RETURN
36 FORZ=1TO1ØØØ:NEXT:RETURN
39 FORX=1TO8:PRINT#1,:NEXT:RETURN
4Ø PRINT#1,"* 3Ø Lines by 32 Chars Max":
GOSUB3Ø:PRINT#1,"* Use the AT Key <@> to
 QUIT":PRINT#1,:PRINT#1,
41 IFLZ=31THENPRINT#1,:PRINT#1,"* buffer
 full":GOSUB36:LZ=LZ-1:A=LZ:RETURN
42 IFLZ=2ØTHENGOSUB33:PRINT#1,:PRINT#1,"
* only 1Ø lines left":PRINT#1,
43 K$=MID$(STR$(LZ),2):IFLZ<1ØTHENK$="Ø"
+K$
44 PRINT#1,LEFT$(K$,2);:GOSUB5Ø:W(LZ)=TK
$:IFK$="@"THENA=LZ:RETURN
46 IFLEN(W(LZ-2))<3ANDLEN(W(LZ-1))<3ANDL
EN(W(LZ))<3THENLZ=LZ-1:A=LZ:RETURN
48 LZ=LZ+1:GOTO41
5Ø K$="":TK$="":PRINT#1,"> ";:PRINT"+ ";
52 IFZD=45ØØTHENERROR6ØELSEZT=PEEK(65414
):IFZT=ØTHENZD=ZD+1:GOTO52ELSEK$=INPUT$(
1,2):ZD=Ø:IFK$=CHR$(8)ANDLEN(TK$)>ØTHENP
RINT#1,K$" "K$;:PRINTK$" "K$;:TK$=LEFT$(
TK$,(LEN(TK$)-1)):GOTO52
54 TK$=TK$+K$:IFK$=CHR$(13)ORK$="@"THEN5
8
55 IFLEN(TK$)>28ANDK$=CHR$(32)THEN58
56 PRINT#1,K$;:PRINTK$;:GOTO52
58 PRINT#1,:PRINT:TK$=LEFT$(TK$,(LEN(TK$
)-1)):RETURN
6Ø PRINT:BEEP:PRINT"? Error"ERR"in"ERL:P
RINT:IFERR=6ØTHENGOSUB39:PRINT#1,"* over
due input...":PRINT#1,:K$="time":GOSUB75
:GOSUB8Ø:GOSUB29:RESUME1
61 IFERR=FKTHENFK=5ØØ:CLOSE:GOSUB1Ø:PRIN
T#1,:PRINT#1,:PRINT#1,"* CLOSED ERROR LO
OP":PRINT#4,"[ "LEFT$(UI$,3):PRINT#1,:GO
SUB75:GOSUB8Ø:GOSUB29:RESUME1
62 IFERR=52ORERR=55THENCLOSE3:GOSUB11:PR
INT#1,:PRINT#1,"* note not found as spel
led":EB$="":GOSUB33:PRINT#1,:RESUME155
63 IFERR=54THENFK=54:CLOSE:GOSUB1Ø:RESUM
E
64 CLOSE:GOSUB1Ø:PRINT#1,:PRINT#1,"* bbs
 error #"ERR"in "ERL:PRINT#4,"? BBS #"ER
R"/"ERL:GOSUB33:PRINT#1,"> re-log necess
ary":PRINT#1,:FK=ERR:Y=Ø:RESUME137
65 PRINT#1,:PRINT#1,"* thank you, "UI$:G
OSUB75:GOSUB8Ø:GOSUB29:GOTO135
75 A$(2)=TIME$:PRINT#1,"* Log Off at "A$
(2):PRINT#1,:PRINT#1,"* Elapsed time:";:
IFA$(1)=""THENMM(3)=Ø:GOTO78ELSEFORZ=1TO
2:MM(Z)=VAL(MID$(A$(Z),4,2)):NEXTZ
77 IFMM(2)=MM(1)THENMM(3)=1ELSEIFMM(2)>M
M(1)THENMM(3)=MM(2)-MM(1)ELSEMM(3)=(6Ø-M
M(1))+MM(2)
78 PRINT#1,MM(3)"Minute";:IFMM(3)<>1THEN
PRINT#1,"s"
79 PRINT#1," ":RETURN
8Ø BEEP:PRINT"* hangup":PRINT#1,:PRINT#1
,"* please hang up now...":PRINT#1,:PRIN
T#1,"> Off  \\\";:GOSUB36:GOSUB36:PRINT#
1,"\\\";:GOSUB36:PRINT#1,"ATH":CLOSE:GOS
UB1Ø:RETURN
85 PRINT#1,:PRINT#1,"* Sysop Chat Mode":
PRINT#1,:PRINT#1,"* now paging Sysop ..
":PRINT#1,:PRINT#1," ";:FORX=1TO1Ø:BEEP:
GOSUB36:PRINT#1,X;:NEXT:PRINT#1,:GOSUB3Ø
:PRINT#1,:PRINT:BEEP
86 PRINT#1,"* if SYSOP doesn't answer":P
RINT:PRINT#1, "  in next TEN SECONDS the
n":PRINT#1,"  he's not in attendance":PR
INT"* key 1 NOW !":PRINT#1,"* wait 1Ø se
c..":FORX=1TO4ØØØ:NEXT:GOTO155
88 BEEP:GOSUB33:PRINT#1,:PRINT#1,"* Hell
o,  "UI$" !!  This":PRINT "* now in Chat
 with "UI$:PRINT:PRINT#1,"  is SYSOP...
You still there ?":PRINT#1,
9Ø GOSUB33:PRINT#1,"* your entry.. press
 <enter> to":PRINT#1,"  send or <@> to e
```

```
xit Chat":PRINT#1,:PRINT
92 GOSUB5Ø:IFK$=CHR$(13)THENPRINT:PRINT:
GOTO1ØØ
94 IFK$="@"THENPRINT:PRINT"* exited...":
GOTO115
96 GOTO92
1ØØ BEEP:PRINT#1,:PRINT "* your turn <en
ter or @>":PRINT:PRINT#1,
1Ø2 GOSUB1Ø5:IFK$=CHR$(13)THENPRINT#1,:P
RINT:GOTO9Ø
1Ø3 IFK$="@"THENPRINT:PRINT#1,:GOTO115
1Ø4 GOTO1Ø2
1Ø5 K$="":TK$="":PRINT"> ";:PRINT#1,"$ "
;
1Ø7 K$=INPUT$(1):IFK$=CHR$(8)ANDLEN(TK$)
>ØTHENPRINT#1,K$" "K$;:PRINTK$" "K$;:TK$
=LEFT$(TK$,(LEN(TK$)-1)):GOTO1Ø7
1Ø8 TK$=TK$+K$:IFK$=CHR$(13)ORK$="@"THEN
112
1Ø9 IFLEN(TK$)>28ANDK$=CHR$(32)THEN112
11Ø PRINT#1,K$;:PRINTK$;:GOTO1Ø7
112 PRINT#1,:PRINT:RETURN
115 K$="":TK$="":PRINT#1,:PRINT#1,"* bye
 "UI$:PRINT#1,"> Please be sure to Log O
ff":RETURN
12Ø PRINT#1,:PRINT#1,"! HOST OFF...":GOS
UB8Ø:CLOSE:CLS:PRINT"* System off at "TI
ME$:GOSUB36:MENU
125 BEEP:GOSUB39:PRINT#1,"* WARNING: Sys
tem Going":PRINT#1,"  DOWN in Two Minute
s":PRINT#1,:PRINT"* warning done":RETURN
128 PRINT:PRINT"> User: "UI$:PRINT:RETUR
N
135 A=Ø:N=Ø:Y=Ø:LC$=UI$:UI$="":ID$="":RC
=FRE(""):RC=Ø:A$(1)=""
137 CLS:FILES:PRINT:PRINT" awaiting at:
"TIME$:PRINT" free memory:"FRE(Ø):PRINT
" last online: "LC$:K$=INPUT$(1,2):GOSU
B13:PRINT:PRINT"* BUSY !":BEEP:PRINT:PRI
NT:GOSUB33
139 PRINT"Chat Stop Caut Who?":PRINT:RES
TORE1ØØØ:FORX=1TO32:READN$(X),P$(X):NEXT
141 GOSUB39:PRINT#1,"* Welcome to the BB
S-1ØØ !!":GOSUB3Ø:PRINT#1,"> Please Log
on:":PRINT#1,:PRINT#1,"* if NEW, use NEW
 as Password":PRINT#1,:PRINT#1,:PRINT#1,
"* enter password:"
143 GOSUB147:PRINT#1,:IFJ="NEW"THEN3ØØEL
SEFORX=1TO29:IFJ=P$(X)THENUI$=MID$(N$(X)
,4):X=29:GOTO153
145 NEXTX:Y=Y+1:GOSUB33:PRINT#1,"* acces
s denied --"Y:IFY>2THENPRINT#1,:PRINT#1,
"* log-on error ...":GOSUB33:GOSUB8Ø:MM(
3)=Ø:UI$="nle":GOSUB29:GOTO135ELSEGOTO14
1
147 J="":PRINT#1,:PRINT#1,"> ";:FORZ=1TO
```


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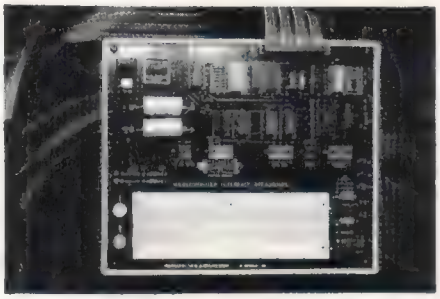

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```
3:GOSUB8:PRINT#1,Z;:J=J+K$:NEXTZ:PRINT#1
,:RETURN
153 PRINT#1,:PRINT#1,"* Log On: "DAY$" "
DATE$"  "LEFT$(TIME$,5):PRINT#1,:PRINT#1
,:PRINT#1,"* Welcome, ";UI$;" !!":GOSUB3
6:GOSUB25:A$(1)=TIME$:PRINT#1,:PRINT#1,"
* <Ctrl-S>=Hold  <Ctrl-Q>=Flow":PRINT#1,
155 K$="Main":GOSUB2Ø:GOSUB39:PRINT#1,"*
 SoftMail-1ØØ  EBBS: "DAY$" "LEFT$(TIME$
,5):GOSUB32:PRINT#1,"* select first lett
er":PRINT#1,:PRINT#1,:PRINT#1,"> Chk Get
 Snd Dwn Tlk Hlp Off ";
157 GOSUB8:Z=INSTR("CGSDTHO@",K$):IFZ=ØT
HEN157ELSEGOSUB39:ONZGOTO16Ø,17Ø,18Ø,2ØØ
,85,159,65,65
159 EB$="ALLØ1":GOTO174
16Ø DE=Ø:PRINT#1,"* Current Messages:":G
OSUB3Ø:PRINT#1,:FORZ!=6393Ø!TO64139STEP1
1:B$="":IFPEEK(Z!)=ØTHEN166
162 FORZI=3TO1Ø:B$=B$+CHR$(PEEK(Z!+ZI)):
NEXTZI:IFINSTR(B$,"ZDO")<1THEN166
164 IFLEFT$(B$,5)<>"SYSDF"THENPRINT#1,"
 "LEFT$(B$,5)"  ";:DE=DE+1:IFDE=3ORDE=6O
RDE=9ORDE=12THENPRINT#1,
166 NEXTZ!:IFDE=ØTHENPRINT#1,"* none"
168 PRINT#1,:PRINT#1,:PRINT#1,"* Mem:"FR
E(Ø)" Str:"FRE(A$)" Mgs:"DE:GOSUB3Ø:PRIN
T#1,"* Copyright 1984 C. Buchanan":GOTO1
55
17Ø PRINT#1,"* Get Mail:":PRINT#1,:PRINT
#1,"* enter TITLE or <enter> to abort":P
RINT#1,:GOSUB5Ø:IFLEN(TK$)>3THENGOSUB9
171 EB$=LEFT$(TK$,5):IFLEN(EB$)<5THEN155
ELSEIFLEFT$(EB$,3)="ALL"THEN174
172 IFLEFT$(EB$,3)<>LEFT$(UI$,3)ANDLEFT$
(UI$,3)<>"SYS"THENGOSUB33:PRINT#1,:PRINT
#1,"* that's not yours !!":PRINT#1,:PRIN
T#1,:GOTO17Ø
174 CLOSE4:GOSUB39:PRINT#1,"* now gettin
g "EB$:OPENEB$+"Z.DO"FORINPUTAS3:PRINT#1
,:GOSUB32:PRINT#1,
175 IFNOTEOF(3)THENLINEINPUT#3,W:PRINT#1
,W:GOSUB35:GOTO175
176 CLOSE3:GOSUB11:GOSUB26:GOSUB32:IFLEF
T$(EB$,3)<>"ALL"ANDLEFT$(EB$,3)<>"Ø:D"TH
ENPRINT#1,:PRINT#1,"* TOSS "EB$" ?":GOSU
B17:IFK$="Y"THENCLOSE:KILLEB$+"Z.DO":GOS
UB1Ø:PRINT#1,"* deleted":GOSUB28
178 EB$="":GOTO155
18Ø IFDE<15ANDFRE(Ø)>14ØØTHENPRINT#1,:PR
INT#1,"* Send Mail:":GOSUB196:IFK$="Y"TH
ENRC=Ø:GOTO184ELSEGOTO155
182 PRINT#1,:PRINT#1,"* sorry, BBS tempo
rarily full":GOTO157
184 PRINT#1,"* review address book ?":GO
SUB17:IFK$="Y"THENPRINT#1,:PRINT#1,"* SE
```


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Requirements: IBM PC or compatible running PC/MS-DOS 2.x-3.x, minimum of 128K memory, and at least one disk drive. PC-DOS may be required for use.

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```
ND TO:":PRINT#1,:FORX=1TO32:PRINT#1," "
N$(X):GOSUB35:NEXTX
186 PRINT#1,:PRINT#1,"* elect 1-32:":GOS
UB5Ø:RC=VAL(TK$):IFK$="@"THEN155ELSEIFRC
<1ORRC>32THEN186ELSEIFRC=31THENRC=Ø:GOTO
184ELSEIFRC=32THENRC=Ø:GOTO155
188 PRINT#1,"* writing to: ";MID$(N$(RC)
,4):ID$=MID$(N$(RC),4,3)+MID$(STR$(MN),2
):W(1)="* from: "+UI$:W(2)="          "+DA
Y$+" "+LEFT$(DATE$,5)+" at "+LEFT$(TIME$
,5):W(3)=" ":LZ=4:GOSUB4Ø:GOTO2Ø5
196 IFID$<>""THENPRINT#1,:PRINT#1,"* CAU
TION: Abandon "ID$" ?":GOSUB17:IFK$="N"T
HENRETURN
198 K$="Y":RETURN
2ØØ IFID$=""ORID$=" "ORID$="Z"ORID$="z"O
RA=ØTHENPRINT#1,:PRINT#1,"* nothing ther
e":GOTO155
2Ø5 PRINT#1,:K$="Work":GOSUB2Ø:PRINT#1,:
PRINT#1,"* Work Area Message:  "ID$:PRIN
T#1,"# lines:   ";A:PRINT#1,:PRINT#1, ">
 Read  Edit  Menu ";
2Ø7 GOSUB8:Z=INSTR("REM@",K$):IFZ=ØTHEN2
Ø7ELSEPRINT#1,:PRINT#1,:ONZGOTO21Ø,25Ø,2
2Ø,22Ø
21Ø PRINT#1,:PRINT#1,:FORX=1TOA:PRINT#1,
W(X):GOSUB35:NEXT:GOTO2Ø5
22Ø PRINT#1,"* Send "ID$" ?":GOSUB17:IFK
$="Y"THEN222ELSE155
222 PRINT#1,:PRINT#1,"* now sending: ";I
D$:OPENID$+"Z"+".DO"FOROUTPUTAS3:FORX=1T
OA:PRINT#3,W(X):NEXTX:CLOSE3:MN=MN+1:GOS
UB27:PRINT#1,:GOTO155
25Ø K$="Edit":GOSUB2Ø:IFA>3THEN252ELSEPR
INT#1,"* you ruined an eraser...":PRINT#
1,"  begin again...":GOTO155
252 PRINT#1,"* select edit line # 4 -"A:
GOSUB5Ø:N=VAL(TK$):IFK$="@"THEN2Ø5ELSEPR
INT#1,:PRINT#1,:IFA<4THEN2ØØELSEIFN<4 OR
N>ATHEN252
254 PRINT#1,:PRINT#1,:PRINT#1,"> "W(N):P
RINT#1,"#"N"of"A:PRINT#1,"*":PRINT#1,"?
Fw Rv Ed Ad Dl To Qt ";
256 GOSUB8:PRINT#1,:IFK$="F"ANDN<>ATHENN
=N+1:GOTO254
258 IFK$="T"THENPRINT#1,"* ";UI$;" to  "
MID$(N$(RC),4):GOTO256
26Ø IFK$="R"ANDN>4THENN=N-1:GOTO254
262 IFK$="Q"ORK$="@"THEN2ØØ
264 IFK$="D"ANDN>3THENFORC=NTO(A-1):W(C)
=W((C+1)):NEXTC:A=A-1:GOTO294
266 IFK$="A"ANDN<=A AND A<3ØTHENA=A+1:FO
RC=ATO(N+2) STEP-1:W(C)=W(C-1):NEXTC:PRI
NT#1,:N=N+1:GOTO29Ø
268 IFK$="E"THENPRINT#1,:PRINT#1,:PRINT#
1,"* old";:GOSUB5Ø:O$=TK$:PRINT#1,"> new
";:GOSUB5Ø:L1=LEN(O$):GOTO282
276 IFK$="R"ORK$="D"THENPRINT#1,:PRINT#1
,"* can't enter masthead":GOTO256
28Ø GOTO256
282 FORZ=1TOLEN(W(N)):IFO$=MID$(W(N),Z,L
1)THENZE=Z-1+L1:RS$=LEFT$(W(N),Z-1)+TK$+
RIGHT$(W(N),LEN(W(N))-ZE):W(N)=RS$
284 NEXT:GOTO254
29Ø PRINT#1,"* input new line":GOSUB3Ø:G
OSUB5Ø:W(N)=TK$:GOTO254
294 IFA=3THEN A=Ø:N=Ø:ID$="":PRINT#1,:PR
INT#1,"* edited away...":GOTO155
296 IFN>ATHEN N=A:GOTO254
298 GOTO254
3ØØ A$(1)=TIME$:UI$="NEW":GOSUB25:PRINT#
1,:PRINT#1,"* HELLO !!":PRINT#1,"* you h
ave dialed the BBS-1ØØ...":PRINT#1,:PRIN
T#1,"* to use service please give:":PRIN
T#1,
3Ø2 PRINT#1,"* name: ":GOSUB5Ø:W(2)=TK$:
IFLEN(W(2))<3THENPRINT#1,"* please respo
nd ...":GOTO3Ø2
3Ø4 PRINT#1,"* thanks, ";W(2):PRINT#1,"*
 please continue ..."
3Ø6 PRINT#1,"* address:":GOSUB5Ø:W(3)=TK
$:PRINT#1,"* city, state, zip:":GOSUB5Ø:
W(4)=TK$:PRINT#1,"* phone: ":GOSUB5Ø:W(5
)=TK$
3Ø8 W(1)=DATE$+" "+TIME$:ID$="SYS"+MID$(
STR$(MN),2)
31Ø PRINT#1,"* please state how we may":
PRINT#1,"  be of assistance...":PRINT#1,
:PRINT#1,"* If you intend to call back,"
:PRINT#1,"  Leave a <3> Letter Password"
311 PRINT#1,"  in Your Message, one that
":PRINT#1,"  You will use for Future Acc
ess.":PRINT#1,:LZ=6:GOSUB4Ø:PRINT#1,
312 UI$=W(2):PRINT#1,"* thank you for yo
ur message,":PRINT#1,"  ";W(2):PRINT#1,:
PRINT#1,"* where pertinent, a Response":
PRINT#1,"  will be put Online for the":P
RINT#1,"  next 48 hours...":PRINT#1,
314 PRINT#1,"* now saving: ";ID$:OPENID$
+"Z"+".DO"FOROUTPUTAS3:FORX=1TOA:PRINT#3
,W(X):NEXTX:CLOSE3:MN=MN+1:GOSUB27:PRINT
#1,:GOTO65
1ØØØ DATA"Ø1 SYSOP",PW1,"Ø2 AAAAAA",PWA,
"Ø3 BBBBBB",PWB,"Ø4 CCCCCC",PWC,"Ø5 DDDD
DD",PWD,"Ø6 EEEEEE",PWE,"Ø7 FFFFFF",PWF,
"Ø8 GGGGGG",PWG,"Ø9 HHHHHH",PWH,1Ø IIIII
I,PWI
1ØØ2 DATA11 JJJJJJ,PWJ,12 KKKKKK,PWK,13
LLLLLL,PWL,14 MMMMMM,PWM,15 NNNNNN,PWN,1
6 OOOOOO,PWO,17 PPPPPP,PWP,18 QQQQQQ,PWQ
,19 RRRRRR,PWR,2Ø SSSSSS,PWS,21 TTTTTT,P
WT
1ØØ4 DATA 22 UUUUUU,PWU,23 VVVVVV,PWV,24
 WWWWWW,PWW,25 XXXXXX,PWX,26 YYYYYY,PWY,
27 ZZZZZZ,PWZ,28 C28$$$,PW8,29 C29$$$,PW
9,3Ø ALL the Gang,VFW,31 List Again,VFW,
32 Cancel,ZND,ZND,ZND
1ØØ8 END
```

PCM

Introducing a new monthly column for you and your Tandy PC

Making Magic with DOS Menus

By John B. Harrell, III

Welcome to PCM's new Tandy PC forum — DOS Boot. In this column, I will explore avenues that will allow you to use the full power of these magnificent machines.

I'll start off this column with the first of a two-part article on using menus to run your applications. The menu program contained in the first part makes the most complex applications as easy to run as pressing a single key. The second part will contain a simple installation that makes changing your menu features a snap.

Why Menus?

This is a reasonable question and deserves an answer. *Menu* was born out of sheer frustration. I set up a multiple-computer installation in my office and encountered two problems immediately. First, someone accidentally formatted one of the hard disks (yes, it was fully loaded!) and, second, everyone kept asking me how to run so-and-so. When the second hard disk unit (mine) was inadvertently erased, I had had enough!

My first attempt at automating this process was to set up a simple menu using a batch file. Have you tried this? It is really *slow*! You also have two other problems. If you scroll the menu off the screen (display a directory, for example), how do you get it back? Also, if you leave it there for extended periods of time, it may ruin your monitor.

I devised *Menu* as a means of protecting the systems and to make it easy for anyone to walk up and run any of the applications on the computer. You can run *Lotus 1-2-3*, *WordPerfect*, *Graphwriter*, etc., all with one keystroke. This is not bad when you consider that my hard disk has 658 files taking up a total of 9 million bytes and using 24 subdirectories.

Menu Magic

Menu is really the most important of three parts of this system that makes it so easy. It is the driver program which interprets your request and executes the correct application (Figure 1 is an example of my system display). *Menu* also allows you to format a disk, to exit to the MS-DOS command level, and will blank the screen after a user-defined period of inactivity.

Menu requires proper installation in the system and this is done by the AUTOEXEC.BAT file when you are boot-

---

(John B. Harrell, III has written for microcomputer magazines for three years. He holds a bachelor's degree in computer science and is a software technical expert for Navy electronic support measures systems.)

Figure 1: Example Menu Screen Display

```
                J. B. Harrell's IBM-PC/XT Selection Menu

          A. Run LOTUS 1-2-3 Spreadsheet
          B. Run LOTUS 1-2-3 Access Manager
          C. Run O.P.E.N Access Integrated System
          D. Run the SYSTEM/36 5250 Emulator
          E. Run WordPerfect Word Processor
          F. Run DisplayWrite 2 Word Processor
          G. Run MultiMate Ver 3.30 Word Processor
          H. Run GraphWriter Business Graphics
          I. Switch output devices for LOTUS graphs
          J. Format a floppy diskette in drive A:
          K. Exit to the MS-DOS command level

                Press a letter key for your selection
DD/MM/YY                                              HH:MM:SS
```

ing the system. Figure 2 is an example of my IBM PC AUTOEXEC file. Notice that it loads several programs which remain resident and MENU *is the last to load*. This is important. Make sure nothing is loaded after MENU that will remain resident when that program terminates.

Another key part of the AUTOEXEC file is the PATH statement. This statement establishes the search path used by MS-DOS when it attempts to execute files. Note the subdirectory named \DOS\BATCH — this is where I put all the batch files linked to MENU.

The last part of the menu system is the batch files. These files are named corresponding to the letter of the option selected. Figure 3 shows batch file A.BAT which executes *Lotus 1-2-3* from the menu. Note the simplicity of the batch file: the CHDIR or CD commands specify the directory to be used. Don't forget the leading backslash (\) as the batch file may not be executed from the root directory, and the last command selects the root directory.

Look again at Figure 1. I reserve the last two option letters for formatting a disk and for exiting to MS-DOS. Pressing the letter corresponding to the FORMAT option will present a secondary option which allows you to select a data disk or system disk format.

Pressing any other key than these two options will instantly return you to the menu. Selecting either option will automatically run FORMAT and prompt for a new disk to be inserted into drive A. This is predominately for hard disk users and I will talk about changing this option later.

Similarly, the last option is reserved for exiting to the MS-DOS command level. With one minor restriction, this is

Figure 2: Example Menu Option Batch File

```
echo off
cd\123files
123
cd\
```

Notes:

This menu batch file corresponds to Option 'A' on the sample menu and will load and run *Lotus 1-2-3* without going through the "access" manager.

1. The echo off command is used to suppress listing the remaining commands in the batch file.
2. The cd\123files command is used to change to the *Lotus* sub-directory — the leading '\' is used to make sure that MS-DOS can find this sub-directory from any other directory.
3. The cd\ command should terminate all batch files to return the system to the root directory at the end of each application.

Figure 3: Sample AUTOEXEC File

```
echo off
date
time
path .;e:\dos;e:\dos\batch;e:\dos\util\myown;e:\dos\util\others
prompt $e[1m{$t$h$h$h} $p$g$e[0m
mode com1:9600,n,8,1,p
spooler 63
cd \dos\sk
sk
cd\
menu
```

Notes:

The sequence of operations must set up the environment (prompts and paths) and load all memory-resident software prior to loading MENU:

1. The PATH command establishes search areas of \dos, \dos\batch, \dos\util\myown and \dos\util\others for MS-DOS.
2. The PROMPT command uses a mixture of "prompting" characters and ANSI.SYS control codes to display the time, path name and '>' prompt in high intensity video mode.
3. The MODE, SPOOLER and SK commands load all memory-resident software prior to loading MENU.

just as if you had booted the computer and were at the first C> prompt. The restriction is that there is a limitation on changes which may be made to the current environment variables. If you are not familiar with this concept (see your MS-DOS reference manual), then don't worry about it. I have encountered few software packages that conflict with *Menu* in this regard.

Answer the prompt with anything other than a Y to exit to MS-DOS and you will return to the menu immediately. Once you are at the MS-DOS prompt, you can instantly get back to the menu by typing the MS-DOS command EXIT and pressing the ENTER key.

Pressing any other option letter displayed on the video screen will load a new version of COMMAND.COM and execute the batch file with the same name as the letter pressed. For example, pressing the letter E (upper- or lowercase) will execute E.BAT which expects to find commands telling the system how to load and run *WordPerfect*.

Once you have finished with the application, use the normal exit procedures just as if you were returning to MS-DOS. The batch file will then execute the remaining commands. When COMMAND.COM realizes that there are no more MS-DOS commands in the batch file, it will terminate and automatically return you to the menu for your next selection.

Should you desire to quit for awhile, don't worry about the bright menu display "burning" into the monitor. At the end of the selected "time-out" period, *Menu* will turn off the monitor with the exception of a flashing prompt reminding you to press a key to return to the menu. While the menu is displayed, the current date and time are displayed for your convenience.

Creating Your Own Menu

This involves two parts. The first part creates the program file MENU.COM. Enter the program contained in Listing 1 and then run it. If it displays an error message, check the DATA statements carefully for typographical errors. If no error messages are displayed, MENU.COM has been created. Type MENU and see the splendid display.

The second installment of this column will give you the menu installation program. This provides an easy mechanism to set the colors you desire and allow you to set the menu option text. Until next month, you can use *Menu* just as it has been created by writing your batch files and using the options with the text displayed.

A Real Good Deal

If you can't wait until next month for a fully operational menu, send me a disk in a mailer with the proper return postage. I will send you a disk with MENU.COM and MENUSINT.BAS on it. I will also configure this disk to be a fully operational system, including sample batch files and demonstration applications.

As published, MENU.BAS only runs on the Tandy 2000. *Menu* will run on all IBM PC computers and compatibles.

If you would like a version for your Tandy 1000 or 1200, follow the same instructions as above. Make sure you specify what computer you will run it on. Tandy 1000 users note: install the software for a color monitor *even if you have a monochrome monitor.*

Please send your disks and pre-paid mailers to LCDR J. B. Harrell, III, 1519-A Carswell Circle, Bolling Air Force Base, Washington, DC 20336.

Finally

You will find *Menu* useful for rapidly changing from one application to another *even if you don't have a hard disk*. If you do not have the statement BREAK=ON in your CONFIG.SYS file, there is no way to exit *Menu* without resetting the system. A simple CTRL-C will suffice to exit if break is enabled in the configuration file.

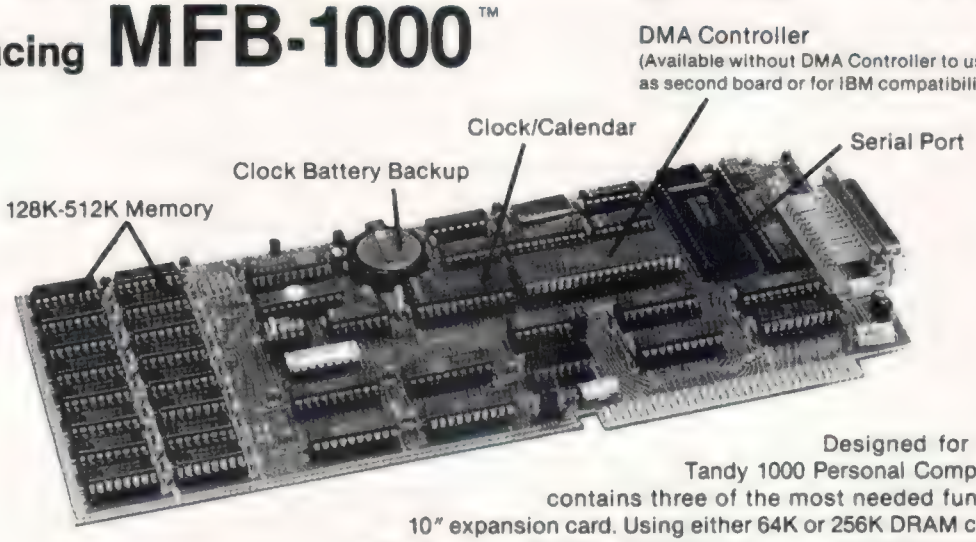
While you are packaging up your disks, take a few minutes and let me know what you would like to see in this column. Some of my ideas are to investigate the MS-DOS commands available to you as a programmer, explain how to manipulate high resolution color graphics and text, an explanation of how monochrome text mode really works, and to make a comparison of Tandy 2000 compatibility to the IBM PC from a programmer's point of view.

Even if you don't send me a disk, drop me a line anyway. I'll be looking forward to your comments. □

The listing:

```
1Ø CLS
2Ø PRINT "Creating binary file: MENU.COM"
3Ø CHECK.SUM = Ø
4Ø OPEN "R",1,"MENU.COM",1: FIELD 1, 1 AS D$
5Ø READ N%
6Ø IF N%<Ø THEN GOTO 1ØØ
7Ø LSET D$=CHR$(N%): PUT 1: CHECK.SUM = CHECK.SUM + N%
9Ø GOTO 5Ø
1ØØ READ CHECK2
11Ø IF CHECK2<>CHECK.SUM GOTO 14Ø
12Ø PRINT "FILE MENU.COM CREATED SUCCESSFULLY"
13Ø CLOSE: END
14Ø PRINT "FILE CREATION ERROR"
15Ø CLOSE: KILL "MENU.COM": END
2ØØ DATA  233, 189,   6,   Ø,  14,  15,   4,   Ø,   3,   Ø,   Ø,  3Ø,   Ø,   Ø
21Ø DATA    Ø,  12,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
22Ø DATA    Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
23Ø DATA    Ø,   Ø,  32,  74,  46,  32,  66,  46,  32,  72,  97, 114, 114, 1Ø1
24Ø DATA  1Ø8, 1Ø8,  39, 115,  32,  84,  65,  78,  68,  89,  32,  5Ø,  48,  48
25Ø DATA   48,  32,  83, 1Ø1, 1Ø8, 1Ø1,  99, 116, 1Ø5, 111, 11Ø,  32,  77, 1Ø1
26Ø DATA  11Ø, 117,  36,  32,  65,  46,  32,  77, 1Ø1, 11Ø, 117,  32,  79, 112
27Ø DATA  116, 1Ø5, 111, 11Ø,  32,  78, 117, 1Ø9,  98, 1Ø1, 114,  32,  49,  36
28Ø DATA   32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32
29Ø DATA   32,  32,  32,  32,  32,  32,  66,  46,  32,  77, 1Ø1, 11Ø, 117,  32
3ØØ DATA   79, 112, 116, 1Ø5, 111, 11Ø,  32,  78, 117, 1Ø9,  98, 1Ø1, 114,  32
31Ø DATA   5Ø,  36,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32,  32
32Ø DATA   32,  32,  32,  32,  32,  32,  32,  32,  67,  46,  32,  77, 1Ø1, 11Ø
```


Introducing MFB-1000™



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33Ø DATA  117,  32,  79, 112, 116, 1Ø5, 111, 11Ø,  32,  78, 117, 1Ø9,  98, 1Ø1
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39Ø DATA   32,  77, 1Ø1, 11Ø, 117,  32,  79, 112, 116, 1Ø5, 111, 11Ø,  32,  78
4ØØ DATA  117, 1Ø9,  98, 1Ø1, 114,  32,  53,  36,  32,  32,  32,  32,  32,  32
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62Ø DATA   83,  45,  68,  79,  83,  32,  99, 111, 1Ø9, 1Ø9,  97, 11Ø, 1ØØ,  32
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89Ø DATA  114,  32, 1Ø7, 1Ø1, 121,  32, 1Ø2, 111, 114,  32, 121, 111, 117, 114
9ØØ DATA   32, 115, 1Ø1, 1Ø8, 1Ø1,  99, 116, 1Ø5, 111, 11Ø,  36,  32,  8Ø, 114
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97Ø DATA  48,  48,  58,  48,  48,  32,  36,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
98Ø DATA   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,  77, 1Ø1, 1Ø9, 111, 114, 121,  32, 114
99Ø DATA 1Ø1,  97, 1Ø8, 1Ø8, 111,  99,  97, 116, 1Ø5, 111, 11Ø,  32, 1Ø2,  97
1ØØØ DATA 1Ø5, 1Ø8, 1Ø1, 1ØØ,  13,  1Ø,  36,  65,  58,  92,  67,  79,  77,  77
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1Ø2Ø DATA  13,  15,  32,  47,  67,  32,  7Ø,  79,  82,  77,  65,  84,  32,  65
1Ø3Ø DATA  58,  47,  86,  13,  17,  32,  47,  67,  32,  7Ø,  79,  82,  77,  65
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119Ø DATA 1Ø2, 111, 114, 1Ø9,  97, 116,  32,  97,  32, 115, 121, 115, 116, 1Ø1
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12ØØ DATA  1Ø9,  32, 1ØØ, 1Ø5, 115, 1Ø7,  46,  32,  65, 11Ø, 121,  32,  36,  32
121Ø DATA 111, 116, 1Ø4, 1Ø1, 114,  32, 1Ø7, 1Ø1, 121,  32, 119, 1Ø5, 1Ø8, 1Ø8
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131Ø DATA 1Ø4, 1Ø1, 11Ø,  32, 121, 111, 117,  32, 1Ø4,  97, 118, 1Ø1,  32,  36
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145Ø DATA  74,   5, 18Ø,   9, 2Ø5,  33, 184,   Ø,  76, 2Ø5,  33, 2Ø5,  18, 2Ø9
146Ø DATA 224, 2Ø9, 224, 2Ø9, 224, 2Ø9, 224, 2Ø9, 224, 2Ø9, 224, 176, 192, 163
147Ø DATA  13,   1, 18Ø,  25, 2Ø5,  33,   4,  65, 162, 1Ø3,   5, 14Ø, 219, 137
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148Ø DATA   3Ø, 183,   5, 137,  3Ø, 187,   5, 137,  3Ø, 191,   5, 186,  14,   9
149Ø DATA  18Ø,  37, 176,  35, 2Ø5,  33, 16Ø,  65,   5,  6Ø,   Ø, 117,   3, 232
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156Ø DATA 17Ø, 187, 179,   7, 232, 219,   Ø, 182,  12, 178,  55, 232, 196,   Ø
157Ø DATA 18Ø, 17Ø, 187, 186,   7, 232, 2Ø4,   Ø, 232,  88,   2,  6Ø,  89, 117
158Ø DATA 142, 186, 161,   5, 232,  92,   3, 235, 134, 254, 2Ø5,  58, 197, 117
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16ØØ DATA 193,   5, 18Ø, 2Ø2, 185,   5,   Ø,  81,  82,  83,  8Ø, 232, 14Ø,   Ø
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163Ø DATA 182,   6, 232, 123,   Ø, 182,  11, 178,  27, 232, 1ØØ,   Ø, 18Ø, 17Ø
164Ø DATA 187, 186,   6, 232, 1Ø8,   Ø, 232, 248,   1,  6Ø,  7Ø, 116,  12,  6Ø
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171Ø DATA 138, 198, 179,  8Ø, 246, 227,  5Ø, 246,   3, 194, 2Ø9, 224, 163,  61
172Ø DATA   5, 195, 252,  83,  94, 139,  3Ø,  13,   1,   6, 142, 195, 139,  62
173Ø DATA  61,   5, 172,  6Ø,  36, 116,   3, 171, 235, 248,   7, 195, 185,   4
174Ø DATA   Ø, 186, 152,   1, 138,   7, 238,  67, 131, 194,   2, 226, 247, 195
175Ø DATA  5Ø, 228, 179,  1Ø, 246, 243, 128, 196,  48,   4,  48, 195, 18Ø,   Ø
176Ø DATA 176,   2, 2Ø5,  16, 187,   3,   1, 232, 216, 255, 18Ø,   1, 185,   Ø
177Ø DATA  96, 2Ø5,  16, 182,   1, 178,   9, 232, 162, 255, 18Ø, 2Ø2, 187, 128
178Ø DATA   3, 232, 17Ø, 255, 185,   3,   Ø, 179,   2,  83,  81, 138, 243, 178
179Ø DATA   9, 232, 14Ø, 255, 18Ø, 2Ø2, 187, 122,   4, 232, 148, 255,  89,  91
18ØØ DATA 254, 195, 226, 233, 182,   5, 178,   9, 232, 119, 255, 18Ø, 2Ø2, 187
181Ø DATA  59,   4, 232, 127, 255, 185,  13,   Ø, 179,   6,  83,  81, 138, 243
182Ø DATA 178,   9, 232,  97, 255, 18Ø, 2Ø2, 187, 122,   4, 232, 1Ø5, 255,  89
183Ø DATA  91, 254, 195, 226, 233, 182,  19, 178,   9, 232,  76, 255, 18Ø, 2Ø2
184Ø DATA 187,  59,   4, 232,  84, 255, 185,   3,   Ø, 179,  2Ø,  83,  81, 138
185Ø DATA 243, 178,   9, 232,  54, 255, 18Ø, 2Ø2, 187, 122,   4, 232,  62, 255
186Ø DATA  89,  91, 254, 195, 226, 233, 182,  23, 178,   9, 232,  33, 255, 18Ø
187Ø DATA 2Ø2, 187, 191,   3, 232,  41, 255, 185,   3,   Ø, 179,   2,  83,  81
188Ø DATA 138, 243, 178,  1Ø, 232,  11, 255, 18Ø,  74, 187, 254,   3, 232,  19
189Ø DATA 255,  89,  91, 254, 195, 226, 233, 182,   3, 178,  18, 232, 246, 254
19ØØ DATA 18Ø,  74, 187,  44,   1, 232, 254, 254, 185,   3,   Ø, 179,  2Ø,  83
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191Ø DATA   81, 138, 243, 178,  1Ø, 232, 224, 254, 18Ø,  74, 187, 254,   3, 232
192Ø DATA  232, 254,  89,  91, 254, 195, 226, 233, 182,  21, 178,  21, 232, 2Ø3
193Ø DATA  254, 18Ø,  74, 187, 185,   4, 232, 211, 254, 187, 1Ø4,   3, 181,   Ø
194Ø DATA  138,  14,  15,   1, 186,  19,   7,  82,  81,  83, 232, 177, 254,  91
195Ø DATA   83, 139,   7, 139, 216, 18Ø, 2Ø2, 232, 182, 254,  91,  89,  9Ø, 131
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197Ø DATA   42, 2Ø5,  33, 138, 198, 232, 196, 254, 163,  4Ø,   5, 138, 194, 232
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199Ø DATA  138, 194, 232, 171, 254, 163,  46,   5, 18Ø,  74, 187,  39,   5, 232
2ØØØ DATA  12Ø, 254, 18Ø,   1, 136,  38,  65,   5, 195, 232, 242,   Ø, 163,  69
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2Ø4Ø DATA    5, 138, 193, 232, 1ØØ, 254, 163,  54,   5, 138, 198, 232,  92, 254
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2Ø6Ø DATA    5, 232,  34, 254, 232, 125,   Ø, 235, 1Ø9, 144, 16Ø,  66,   5,  6Ø
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2Ø9Ø DATA    Ø, 139, 2Ø8, 139, 2ØØ, 161,  69,   5,  43, 2Ø8, 184,   1,   Ø,  43
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212Ø DATA   54,  67,   5, 178,  22, 232, 186, 253, 18Ø, 17Ø, 187, 223,   4, 232
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218Ø DATA  253, 195, 18Ø,  44, 2Ø5,  33, 187,  6Ø,   Ø, 138, 197, 246, 227,  5Ø
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222Ø DATA  1Ø3,   5, 2Ø5,  33, 14Ø, 2ØØ, 142, 216, 142, 192, 142, 2Ø8, 139,  38
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24ØØ DATA    Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
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242Ø DATA    Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
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247Ø DATA    Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
248Ø DATA    Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø,   Ø
249Ø DATA -1, 278863
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PCM

MAI Accounts Payable: An Easy-to-Use AP Program

Software 2000

MAI's *Accounts Payable* program makes the chore of paying bills a little easier. The software can be operated separately or as an integrated part of the MAI accounting system. A Tandy 2000 with 128K RAM is required, one or two floppy disk drives and a printer with 132-column width.

Several Tandy printers are accommodated, but at present there is no way to configure the printers. MAI is working on printer drivers and will send the update free to registered users. I used the Line Printer VI, but even with 132-column paper, some of the printouts went off the right-hand edge of the paper. If you put your printer in condensed mode, everything will print on the page.

The software accepts either cash or accrual acounting, has a consistent debit/credit balance with automatic control during data entry and allows posting to once-only vendors. If interfaced with the *General Ledger* program, payments and invoices are posted to the proper accounts, and a posting distribution report is generated.

The discount due date, discount amount and invoice due date are calculated automatically. Safeguards are installed to protect against duplicate invoice payments. Editing and data verification are done online, and discounts are recorded in advance or at time of invoice payment.

Either partial or full payment of invoices is allowed, and file sizes can be expanded in mid-year, based on account activity. An aged open invoice report is printed by invoice received date or by due date. Full details or a summary can be shown.

A special feature of this software is password protection to restrict access to any menu. The data entry operator could post invoices and generate vendor labels, but could be restricted to printing checks.

Forecasting the cash requirements is shown by month, or by user-definable number of days per period. Invoices are selected for payment based on invoice due date, vendor, pay cycle or any combination of the three.

The system accepts up to 200 vendor accounts and 2,000 open invoices, with 10 percent disk space left over and mailing labels for vendors are generated by the program.

The main menu is simple and easy to understand. The choices are 1) definition — to personalize the system, 2) system — to operate daily entries and 3) utilities — to back up the data. The user manual has a nice flowchart illustration which shows the progress of the program.

The definition option sets up the company name and address, with federal, city and state tax ID numbers. Prompts ask if the company has divisions, uses preprinted check stock and operates on a cash or an accrual basis. Common payment terms such as 2/10 net 30 are predefined with a special two-letter code. When invoices are entered, the vendor's default payment terms are automatically displayed.

Checks are printed with detailed payment information, and can be drawn on up to 24 bank accounts. Bank ID codes are set up for each account, account numbers are entered, and a general ledger account number can be assigned to each checking account.

Manually written checks can be input into the payables system at any time during the month. Checking accounts are reconciled with bank statements, with provisions for interest, service charges and other adjustment such as credit card fees.

One nice feature is treatment of discounts. If the "discounts assumed" option is chosen, and an invoice for $100 with two percent discount is entered, the system posts $98 to the expense account and to open accounts payable. If the discount is lost, $100 is posted to cash, $98 to open payables and $2 to discounts lost.

The retention part of the program allows for partial payments of an invoice. Full payment might be withheld until certain conditions are met, such as completion of work or installation of equipment. During automatic payment selection for any retained invoice, the amount paid is invoice value less the retained amount. If cash, rather than accrual basis is selected, this retention feature is not available.

Vendor codes can be alphanumeric or numeric only, up to six characters per

vendor. If divisional reporting is chosen, the first two characters of vendor code show which division accrued the payable. With this feature, payables and expenses are reported separately by company department.

After the vendor's code, name, address and phone number are installed, an eight-character sort key is set up for each vendor. The program defaults to the first eight letters in each vendor's name, but customized codes can be entered. If you try to delete an active vendor, an error code appears and the program refuses to delete the vendor.

An optional pay cycle can be set up for each vendor. Perhaps you want to pay the landlord on the first of the month, and the telephone company on the 15th. Numbers greater than 31 can be entered for quarterly payments such as insurance.

Vendors can be defined in mid-year, and purchases-to-date, returns-to-date and year-to-date purchases/returns are automatically calculated. The general ledger account most often used with a vendor is set up, and when invoices are posted, the screen shows the account number as a default.

The vendor masterfile listing prints summary reports in alphabetical or vendor code order. Some, or all, of the vendors can be listed. A second report, the vendor detail listing, shows open invoices by vendor. A vendor cross-reference listing which prints on the screen shows vendors by numeric code and alphabetically. This helps control duplicate entries of vendors. Mailing labels are printed for all vendors, or for a selected few. A test pattern aligns the labels.

The invoice entry/check payment program is simple to use, but has some built-in controls. The vendor code prompt displays a '#' sign for numeric data and a square block for alpha. Up to 10 alphanumeric characters are input for invoice number, and the date can be input or defaulted to today's date. A non-discountable amount, such as freight charges, could be shown, and the prompt for invoice amount shows commas so it's easy to enter the amount. A 15 character memo can be added.

I liked the posting function of the invoice entry feature. Total amount to be distributed is shown on the screen. If the invoice is for $500 and $300 is posted to inventory, $200 appears in the distribution box to show how much is left to post to another account.

The invoice can be edited several times. Use of function keys moves the cursor to previous or next entry while the invoice is on the screen. A second chance to edit is a menu option. If the invoices have already been updated, another change is made by using adjusting entries. Once an invoice has been paid, it cannot be canceled or deleted.

When all invoices have been posted, a data entry register prints out. If the system is integrated with the *General Ledger* module, all entries are automatically posted. For a non-interfaced system, a hard copy of the entries is produced.

Handwritten checks can be entered into the payables system, and a manual register and update report are generated.

Check writing is easy with this MAI program. The checking account number is chosen, and the options of payment by cycle, due date or discount date are selected. A sample check pattern can be run to align the checks in the printer, and starting check number is input. If the checks ran improperly, a restart function is available. After the checks have been printed and the paper is changed, a check register is printed.

A manual payment selection is available instead of automatic payment, and invoices are selected for payment on a vendor-by-vendor basis.

Four excellent accounts payable reports are generated by the system — an open invoice report, aged open invoice, cash requirements and a disbursement register.

At the end of the month, an end-of-period processing function is run to clear the files and zero out the totals. The checking account(s) can be reconciled with the bank statements, and a hard copy is printed.

I encountered some problems with an error message 16, which did not appear in the user's manual. A toll-free call to MAI's technical support resulted in a quick fix to the problem. If the program is run without using the Reset button, a problem with the `CONFIG.SYS` file occurs. However, once the system disk is in Drive A, reset, then everything works fine.

I was impressed with the technical support of MAI, as well as the ease of use of the program. Function keys made data entry much easier, and the program ran smoothly on the Tandy 2000 without any delays while the data was saved to disk. This software is easy to use, and no accounting knowledge is necessary.

(MAI, distributed by Tandy, One Tandy Center, Fort Worth, TX 76102, $495)

— M.J. Batham

Software 1000/1200

Joe Lynn Payroll: Inexpensive and Complete

Life was surely simpler during the barter period. If someone helped you with your harvest, you helped him with his harvest or gave him a share of your crop. No paperwork; no forms; no taxes.

Well, for the small business operator with employees, life is not that simple now. He has a few partners in the form of federal and state governments who require a lot of attention without contributing positively to the bottom line. Modern reality requires the hassle of preparing payroll checks, deductions for federal, state and Social Security (an interesting misnomer) taxes.

Also, there are deductions for medical insurance and other employee contributions with the joy of reporting and paying all of these deductions to the appropriate governmental or financial organization.

To assist the small businessman with these necessary payroll and witholding tasks, Joe Lynn Computer Services has released a payroll system utilizing the capabilities of the Tandy MS-DOS computers to perform payroll calculations, posting and check printing.

Joe Lynn, who has previously released business-oriented programs for TRSDOS Tandy computers, has now focused his efforts on releasing software for the new Tandy MS-DOS machines.

The *Payroll System* actually consists of several programs and files all interacting together to form a payroll system which is extremely easy to operate. The only computer expertise required is the ability to insert a diskette and type `PAYROLL`. A series of menus then leads the user through the various steps necessary to enter employee data, maintain necessary year-to-date records and

print checks. No confusing technical jargon is used.

Although the program is simple to use, its capabilities are quite complete. The *Payroll System:*

- Calculates FICA, federal and state witholding tax plus four miscellaneous deductions automatically.
- Totals hours and wages for up to 10 departments.
- Allows miscellaneous deductions to be computed as a percentage of gross wages, amount per hour worked or fixed dollar amount.
- Has state witholding tax tables predetermined for each state.
- Maintains state and federal tax exemption independent from each other.
- Has the capability to exempt individual employees from FICA (Social Security).
- Maintains an employee status file which can be updated easily.
- Allows hourly or salary pay scales.
- Allows salary override.
- Calculates regular time, time-and-a-half and double-time for hourly employees.
- Prints checks and check stubs for a single pay period with year-to-date totals on the pay stub.
- Allows sample checks to be printed to align printer.
- Has an automatic mode to print checks that have the same hours or salary each pay period.
- Lists all checks issued each pay period.
- Prints year-to-date, quarter-to-date and period-to-date totals.
- Computes and prints data for quarterly tax reports.
- Has the ability to convert data from an existing payroll system in the middle of a year.
- Handles up to 999 employees.
- Prints W2 forms.
- Lists all employees by number or alphabetically by last name.
- Uses a standard check form (NEBS #9022).

While these capabilities are not surprising and are contained in most full-featured payroll programs, what is surprising is that you get this all for $49.95. Joe Lynn has evidently declared a software price war.

Curious about how such a complete program could be offered at such a low price, I called him and was informed that software selling prices are determined by the actual production costs of the package (disks, binders, printed material, etc.), the costs of distribution (two-step software distribution and retailers profits), advertising costs and programmers profits. By selling direct, he feels that he can offer quality software comparable to packages selling for up to 10 times his price in sufficient quantity to make a fair profit.

The low price is also his way of combatting software piracy. He feels that the likelihood of customers copying and passing-on software diminishes if the purchase price is reasonable.

Whether or not his assumptions are accurate remains to be seen. However, this program at this price is certainly a value.

To handle the varying tax laws for each state, different program versions are released for each state with the proper tax witholding tables predetermined and embedded in the program. At year's end, these tax tables are not user-changeable. As federal, FICA and state tax rates change with the start of

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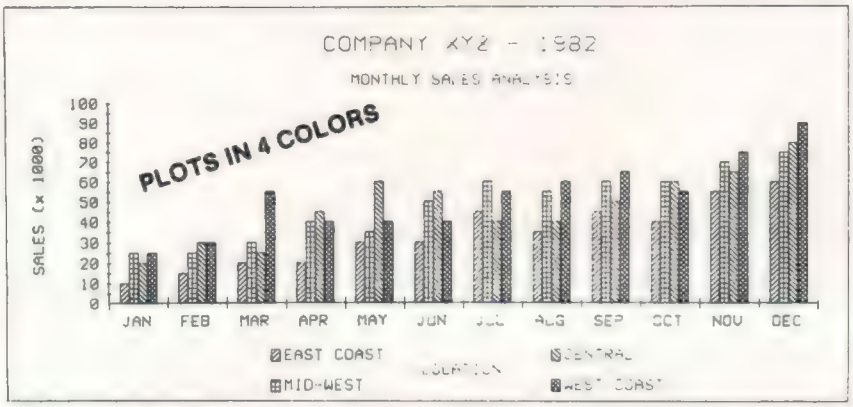

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a year, the purchase of a yearly update for half the current cost of the program is required to get the new tax tables.

To test the mathematical accuracy of the program, I ran it parallel to a megabuck existing payroll system, running on an IBM mainframe. The results were identical. The major functional differences between the two systems were that the *Lynn Payroll System* was limited to 999 employees and only four miscellaneous deductions.

A special payroll system for restaurants, (not tested) is available for $149.95 which includes the ability to handle tips and draws.

If you are still producing a manual payroll, the costs and risks of computerizing your system are now very low. Besides the low price, a 30-day money-back trial period is offered. Since the program disk is not copy-protected, Joe is truly a trusting man. He would have enjoyed the barter system.

(Joe Lynn Computer Services, 23501 W. Gagne Lane, Plainfield, IL 60544, (815) 436-4477, $49.95)

— Bruce Rothermel

Supercharge your ROM with *Textpro* and *Supera*

The more you use a machine like the Model 100, the longer your wish list of additional features grows. Some may be as routine as global search and replace or as sophisticated as a keyboard macro ability similar to what you already have on your desktop PC. Perhaps you hope to use the LCD as a video prompter. Or how about "windowing" on the small screen? Well, the 100 still doesn't do windows, but with a little software magic, you can look at one file while you edit another. The secrets are hidden in two programs from Micro Demon called *Texpro* and *Supera*. These programs shorten the wish list and boost your ROM power substantially.

Texpro and *Supera* combine many unique and useful utilities into a single package. *Texpro* is a subset of *Supera* and contains all of its text capabilities.

Texpro and *Supera* load themselves from cassette after first determining your machine's memory size. What looks like a BASIC program now appears on the main menu. To turn *Supera* or *Texpro* on, place the cursor over the filename and press ENTER. The names of ROM TEXT (and for *Supera*, BASIC are changed so you can tell at a glance whether *Texpro* or *Supera* is enabled. If need be, you can turn *Texpro* and *Supera* off and even get rid of them altogether. But heed the manual's warning; to kill these programs you must first turn them off or face a certain cold start.

The documentation for *Supera* is complete, accurate and full of examples. It is also large, bulky and difficult to read. The print in the *Texpro* manual is better but still not good. Both manuals would benefit greatly from typesetting. As always, a portable quick reference would be a further plus.

Texpro and *Supera* allow you to define 26 function keys (A-Z) and several special keys. Suppose you are

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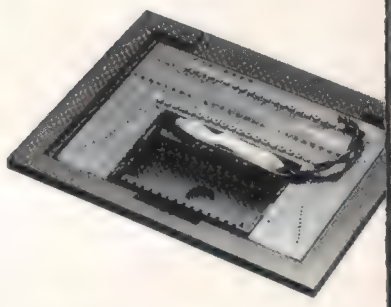
128K RAM

Installs as easily as plugging in a socket



Software included, transfers from bank to bank. Works like main menu! Includes powerful RAM Basic that lets programs store and access data from any other bank.

PCSG says: Satisfaction guaranteed or your money back within 30 days

As amazing as it seems you can upgrade your Model 100 to 128K of RAM in just 60 seconds.

It comes to you right out of the box looking just like the picture. You just open the little compartment on the back of your Model 100 with a quarter and it just pushes right into place. You can then put the cover back in its place.

You then have 4 banks of RAM of 32K each. The additional three banks also work just like your Main Menu.

You push a function key and you are in the second bank. Push again and you are in third, again, then fourth. Press it once again for your original bank.

It has its own built-in NiCad battery that recharges right from the Model 100 and its guaranteed for a full year.

What is really great is that you can copy a file from one bank to another with just a function key.

Each bank is like having another Model 100, and all the built-in programs as well as any snap-in ROM programs appear in all four banks and work the same way. Your widebar cursor moves from file to file and you access any file or run any program just by pressing ENTER.

What lets you copy any file from one bank to another is a snap-in ROM from PCSG called RAM+, that comes at no extra charge. It just pushes right into the little socket in that same compartment with the 96K expansion unit.

Not only does this firmware let you copy a file from bank to bank, but you can make a copy of any file within the same bank instantly with a function key. Great for Lucid spreadsheets!

Copy a file from bank to bank with a function key

You can also rename a file, or kill any file with just a function key. Plus you can do a whole lot of other useful things like setting the date, day and time with function key ease. You even have a function key that lets you use non-Radio Shack printers without having to make those tricky dipswitch settings.

RAM+ lets you cold start any one of your banks without affecting the other three. That means that anytime you want you can clean out a bank's entire memory, but leave intact all the files in the other banks.

What is also fantastic is that you don't have to have the ROM in place to use the additional RAM. Whenever you take out the snap-in ROM it leaves behind a tiny machine code program that lets you switch from bank to bank just by pressing ENTER.

This lets you use your ROM socket to snap-in other ROMS like LUCID spreadsheet, WRITE ROM text processor, or DISK+ ROM file transfer program, and use them in any or all four banks. All of these, by the way, are available from PCSG.

When you are ready to copy a file from one bank to another or use any of the other fantastic functions we talked about you can just snap the RAM+ ROM back into place.

Everybody that has this 128K system in their Model 100 is so excited, because it gives them four times the capacity and all banks work just like the Main Menu.

And what has made a lot of people happy is that the system bus, located in the same compartment, is left free for you to plug in a DVI or the Holmes Engineering/PCSG portable disk drive.

The ability to copy a file from bank to bank instantly with a function key, plus all of the other features make this RAM extension truly an engineering masterpiece.

Some people hesitate when they think of installing something, and then others are skeptical that any additional hardware could be as good as the Model 100 itself. That's why we sell these 96K expansions on a 30 day trial. Simply return it within 30 days for a full refund if you are not satisfied. Priced at $425. MC VISA COD.

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PORTABLE COMPUTER SUPPORT GROUP

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writing about *Supera*. You can assign the program name to a function key by pressing ESC 4. In response to the "key" prompt, type the letter S. Now type the exact character string you wish to assign (Supera). From then on, pressing ESC S will type Supera for you.

Need to check another file? *Texpro* and *Supera* enable you to view a second file while editing the first. If you write from an outline as I do, *Supera* can help. While composing a document, I can review my outline by simply pressing ESC 3 and typing the filename. Since I frequently do this, I assigned this process to a function key so that checking my outline is as simple as pressing ESC 0. Because there is no way to check a function key definition, I always use some sort of mnemonic device such as 'O' for "outline."

A variation on viewing other files is to create a special file called HELP.DO and view this help file by pressing ESC 6. You might use this to record the various special key sequences used in the program. In any case, you will need to experiment with this ability because the order in which the files are created seems to make a major difference. Some files appear instantly; others take so long that you are tempted to reset the machine. You do get an immediate message, and the manual reassures that "everything is OK."

If you are accustomed to other word processors, then you will appreciate the "type-over" ability that *Texpro* and *Supera* add to TEXT. Pressing ESC 1 turns on type-over and what you type replaces the text in your file. ESC 2 cancels type-over and returns you to "insert" mode.

One of the best features of *Texpro* and *Supera* is the addition of global search and replace to the TEXT program. The F4 key is assigned this function (one of the few times, unfortunately, that Micro Demon uses standard function keys). Unlike most search and replace programs for the Model 100, this one offers a prompted option. If you reply Y to the "Want Prompting (Y/N)" question, *Texpro* and *Supera* will show you each occurrence in context and let you decide whether you want to replace it. The prompted option makes search and replace extremely useful.

For proofreading a file, you can let *Texpro* and *Supera* do the scrolling. ESC followed by the down arrow key scrolls the current file a line at a time. The timing is good for reading, but this function would be vastly improved if Micro Demon added the ability to adjust the speed of the scroll. In any case, you can pause the scrolling at any time by pressing the SHIFT key and resume scrolling with another SHIFT press. You really can use the LCD as a teleprompter and keep your speech notes on the small screen!

Texpro and *Supera* add a variety of special editing keys to TEXT. Key combinations are provided to delete a word or line, to substitue for the past function and to change the case of the character below the cursor. The real power of these programs comes in combining these editing functions in keyboard macros or function key definitions to automate editing. The manual provides example definitions to delete from the cursor to the end of the file, to erase every other line and to change the case of the previous word (since you forgot and left the CAPS LOCK on).

All features described thus far apply to both *Texpro* and *Supera* while in TEXT or while using the EDIT command to change BASIC programs. *Texpro* stops with TEXT, but *Supera* adds a great deal more to enhance the other ROM programs and main menu functions.

Supera offers a whole set of CTRL key combinations to enter the other ROM programs directly from BASIC, replace current function keys for LIST, FILES and MENU, and use the additional capabilities that *Supera* adds to your machine. *Supera* features a "calculator" mode, automatic line numbering in BASIC (at last!), and of course all the definable function keys already described. Because one set of function keys does not fit all ROM programs, *Supera* lets you save and restore whole sets of function keys.

Calculator mode in BASIC is particularly interesting. You can quickly check a calculation and save the result to a BASIC variable. *Supera* also converts decimal to hexadecimal and vice versa. It even makes provision for multiple PEEKs and POKEs.

Now for file management from the main menu. *Supera* adds CTRL key combinations to kill, rename and check the size and memory location of files. The only wrinkle is that *Supera* will allow you to create duplicate filenames when renaming and even permits invalid filenames. The first is a nuisance; the second is a real plus since it can be used to prevent accidental deletion of files. If Micro Demon would only use the Model 100's own function keys for these menu enhancements, they would be much less confusing.

But there is trouble in paradise. *Supera* comes with a starter set of function keys. These were not defined as documented. Fortunately, it was a simple matter to redefine them to specification.

I have two gripes with these programs. First, there is no way to check the definition of a function key without using it. When a key has been defined to do special or complex editing, this is totally unacceptable. The problem is worse as you build multiple sets of function keys. You must simply maintain an external list of function key definitions or use all your RAM for large "help" files.

My other gripe is that different ROM modes require different methods. To define a function key in BASIC you press CTRL D rather than ESC 4 as in TEXT. You can activate a function in BASIC either by ESC followed by the letter or by using SHIFT plus the letter while CAPS LOCK is down. This second method is the only one that works in TELCOM, SCHEDL or ADDRSS. So you invoke a function key from TELCOM in one fashion, from TEXT in another, while BASIC allows either. Since function definitions work across all modes, the use ought to be consistent. All this makes the function keys more difficult to use and less *functional*.

Texpro and *Supera* offer plenty of bang for the byte. But they may not appeal to the casual user of the Model 100 because of the many key sequences to master. If you are accustomed to other programs using CTRL key sequences, *Supera* and *Texpro* might not seem difficult at all. In any case, the search and replace and function key ability are well worth the price of admission.

Which do you need? If most of your work is with TEXT, save money and memory with *Texpro* (about $30 and 1.5K). But if you want ROM performance, you'll really appreciate the *Supera* supercharge.

(Micro Demon, Inc., P.O. Box 50162, Columbia, SC 29250, 803-733-0908, 16K cassette, *Supra* $79.95; *Texpro* $49.95 plus $3 S/H each)

— Dennis Kirley

VoiceCommand: Voice Recognition — For a Price

Many of us have seen those super intelligent computers and robots in the movies that talked and listened to the people who were (supposedly) their masters. After seeing this sort of thing, you start to wish you could do the same things with ordinary desktop computers in the real world.

Speech synthesizers have been in fairly wide use for some time and in some fields have already become old hat; but speech recognition is another matter entirely. Getting a machine to identify the words a person speaks with any degree of accuracy is something that has been sought at least as far back as the early 1960s when Dr. Harry F. Olson at RCA demonstrated a crude version of a voice-operated typewriter. Lately there have been a number of voice recognition boards offered for various computers; judging by their limitations, HAL is still some time off (but may yet arrive by 2001). Meanwhile, Logical Business System's *VoiceCommand* is here now, and (although it is a bit awkward) it can be a very useful addition to a desktop computer.

The *VoiceCommand* board, which (like so many other products) was designed for the IBM PC, works just as well in the Tandy 1200. (It takes up the full length of a long slot, and won't fit in the Tandy 1000.) It needs 256K of RAM, and when you are actually using it you may need even more than that since the resident program involved takes up over 60K. The board has its own microprocessor and 16K of RAM for its own use (it doesn't appear in the computer's RAM space).

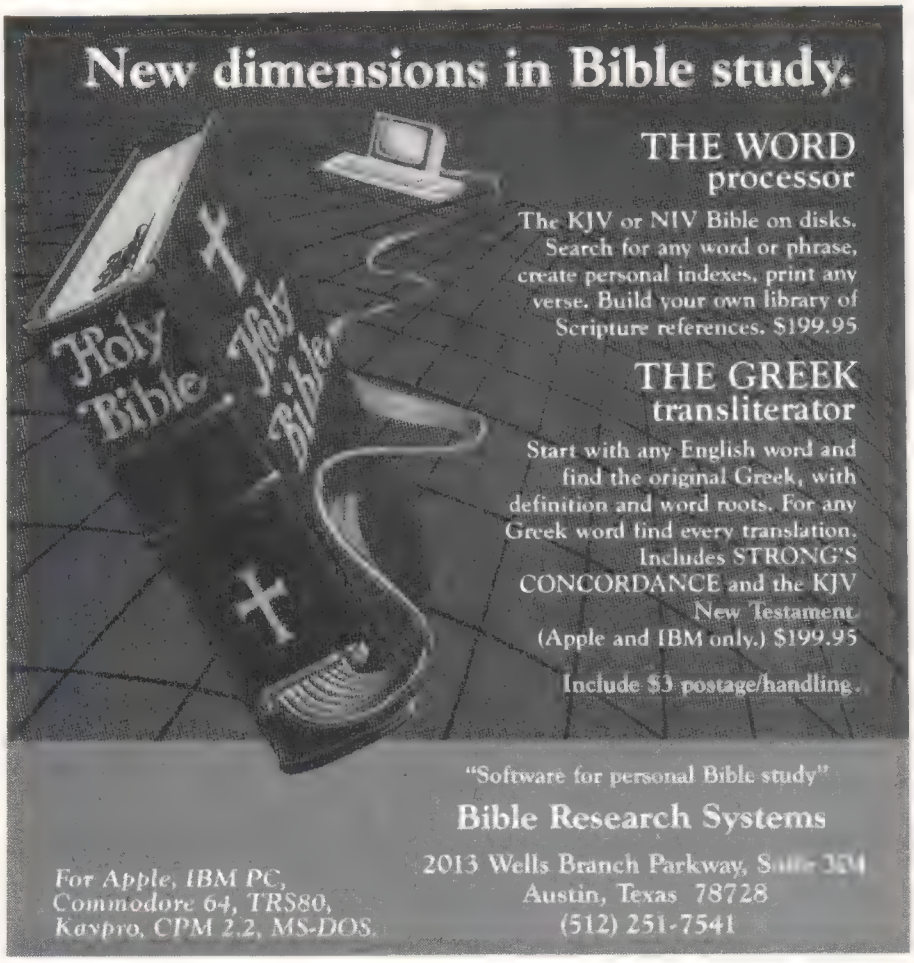
On the back plate is a microphone jack; a good directional mike should be used to keep down extraneous noises. The microphone that Logical sells works well, and costs $79.95. Installation is no problem; please remember to unplug the computer first, but since it does take up a slot and the Tandy 1200 then has only one slot left, you may end up needing one of the multifunction boards for the more common expansion options.

VoiceCommand comes with a good set of driver programs. VEXEC is the program that stays in RAM all the time and handles the task of controlling the board and passing commands to the computer. BVOICE loads a vocabulary into the board and into RAM, and also operates as a setup program to let you create and update vocabularies, train the system to recognize your voice for each word and check to see if everything is working properly. There are also a number of sample vocabulary files that let you try out the system quickly without having to create a vocabulary. A copy of Ashton-Tate's *Framework* demonstration disk is included with a vocabulary to match; it requires 384K, and the Tandy 1200 I used has only 256K, so I wasn't able to try it.

VoiceCommand can have a vocabulary of up to 500 words in place at a given time. The specs also say that a total of 32,000 words can be made available in up to 64 vocabulary files, but the manual isn't clear about how these limits were arrived at. A typical vocabulary will probably have only 20 to 30 words appropriate to a given application. The BVOICE program has an editor to let you set up the command words and action strings involved.

The action string is a string of characters that are to be entered, while the command words represent the words to be spoken. For example, the command word "directory" might stand for the directory command; the action string might be DIR. A windowing feature will let you specify that certain functions can be used only after others have been used. You could set the words representing the numerals one through nine, for instance, so they won't work unless you have opened the window by saying "numbers" first. Finally, there's a "popup" function that lets you, by saying "popup" while running an application, bring up a list of the available words without breaking out of the main program.

After you have a vocabulary file for the application you want to use, the next step is to "train" it to recognize your voice or that of the person who will be using the application. For each word in the file, *VoiceCommand* will memorize the pattern of your voice as you say the word. As far as I could tell, no



connection is needed between the word you typed in before and the word you speak; if you felt like being silly you could, while training a file, say "rutabaga" and have it mean "directory." Since we hardly ever speak the same word in exactly the same way twice, *VoiceCommand* has some tolerance for different inflections; the manual claims that the board is 75 percent accurate after one training pass. You can run through the training procedure again; each time, as the "image" of the way you say each word becomes more accurate, so does the recognition process; after seven training passes the system is said to be 98 percent accurate. When we first tried out the *VoiceCommand* board we found that the system would occasionally accept commands from other people besides the person who had trained it; it wasn't reliable by any means, and Logical Business Systems doesn't recommend it, but it did happen.

Finally, starting up *VoiceCommand* to actually use an application is quite simple. You just enter VEXEC to load the main program, then type BVOICE followed by the name of the file and your initials. After the vocabulary is loaded, you're ready to start giving commands by voice. Load up your application program, press the NUM LOCK key to enable voice input, and start talking. If at some point you (or someone else) says something that doesn't match a word in the vocabulary, the computer's speaker will beep to let you know. If you want to switch off the voice input at some point, just press NUM LOCK or switch off the microphone itself, if yours has a switch.

In our tests, *VoiceCommand* recognized words quite well as long as they were spoken distinctly, which is all one really has a right to expect at this stage. In a reasonably quiet office or home setting it should work just fine; a noisy environment, like a factory, will almost certainly cause trouble. If you have an application that uses a set of fixed commands and you'd like to convert it to voice input, *VoiceCommand* can fill the bill quite nicely.

(Logical Business Systems, 264 Santa Ana Court, Sunnyvale, CA 94086; board $499, microphone $79.95)

— Ed Ellers

Software 1000/1200/2000

Teleterm: Powerful Communications

If *Teleterm* were just a communications program, it would rate as a success in my book. In fact, *Teleterm* contains a host of features in addition to communications. Although full featured programs can be so complicated to learn that they become a trap for the novice, *Teleterm* can be easily mastered for basic communications. Advanced features, however, are available for the sophisticated user.

Entering TELETERM from DOS prompt yields the program's main menu. Selections include "Creator/Editor," "Communications," "Text Editor" and a "Translation Table Print" routine. Since communications will be the primary use of *Teleterm*, I will deal with that function first. Selecting the communications option from the main menu generates a "loading" message that lasts 10 seconds or so. The screen clears and the user is asked for a terminal name. Actually it is the name of a disk file containing communication parameters that is being requested.

At this point the name of a terminal file may be entered. If the ENTER key is pressed instead, *Teleterm* will search available drives and list any files with a .TRM extension. The request for a filename is then repeated. The first time, I had no idea which file to choose, so I just picked one at random. Once I selected a file, its parameters were set and the communications help menu appeared. The A and P options of the help menu allow easy changing of the settings from the disk file. Once the settings are to your liking, those settings may be saved to disk as a new .TRM file. Next time, giving that filename will bring the communications mode up as you set it. For instance, I changed the parameters to the setup I use for CompuServe and saved that file as COMPUS.TRM.

The help menu has 33 commands on it, but actually entering terminal mode is not one of them. Pressing ENTER puts you into terminal mode, ready for communicating. The immediate effect of this is that the screen goes blank.

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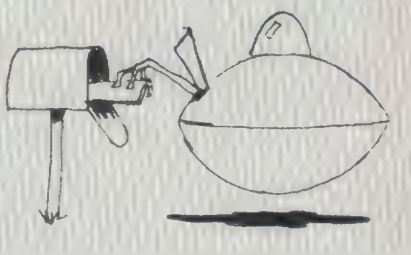

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There is supposed to be a "Teleterm ready" message at this point, but I only got it some of the time. Once in terminal mode, *Teleterm* sends the necessary signals to start communication with the machine on the other end of the line.

I think this is the place to comment on one of my problems with *Teleterm*. My experience was that the documentation was good and covered most of the information that a user would need. The organization of that information left something to be desired. My biggest problem was figuring how to get out of the various segments of *Teleterm*. The documentation was very good at telling you how to initiate a function, but how to exit was often left until the end of that section of the manual. The people at Telexpress seemed to appreciate my comments in this regard and promised to consider them carefully. The manual for the Tandy 2000 and MS-DOS versions had not been typeset and it is quite possible that some of my suggestions will make the final version.

Eventually you will discover that the ALT key serves as a control key when in terminal mode. Most of the commands available from the help menu are available from within terminal mode by pressing ALT and the key together. Pressing ALT H will return you to the help menu itself. If you are in contact when you press ALT H, *Teleterm* will maintain contact while you access commands on the help menu. Being able to change settings such as echo without breaking contact is very useful.

Teleterm supports both unblocked ASCII file transfer and the *XMODEM* protocol for sending and receiving files. Both of these methods allow file transfer directly to or from disk. This means that the size of the file you can send or receive is limited only by the capacity of your disk and/or the length of time you can spend connected.

There is also a special mode for transfer called *Teleterm* blocked mode. This method uses an error checking procedure to assure accurate file transfer, but can be used only when both computers are using *Teleterm*. The documentation does mention the fact that *XMODEM* transfer is also referred to as "Ward Christensen" and "MODEM7." This bit of information will be helpful to beginners since I have found that every bulletin board uses a different name for the upload/download protocols.

The first time I used *Teleterm*, I opened the memory buffer to receive the data coming in from a session on CompuServe. When this buffer gets full, a message appears to that effect and a filename is requested to save the buffer. The technical people at Telexpress told me how to avoid this problem, but had I written the manual, I would have bragged about the receive direct to disk feature. If you set the receive-to-disk mode at the beginning of a session, all incoming data is saved to a disk file on the fly. As the buffer fills, *Teleterm* writes it to disk without operator intervention. The display leaps ahead after completion of disk access indicating that the incoming data is still being accepted during the disk write.

Mention of the memory buffer brings up another important feature of *Teleterm*. One of the options at the main menu is a text editor. This editor is also accessible from the communications mode and can be used to edit whatever is in the buffer. For many applications it is a major convenience to have a text editor built in to your terminal program. Received text can be edited in the buffer before it is saved to disk. Outgoing files can be loaded to the buffer, edited and then transmitted. Messages and responses to received mail can be composed and edited in the buffer rather than typed on the fly. *Teleterm* will stall with the appropriate signals while you use the editor online. While the text editor has adequate editing commands and will provide a printed copy of text in the editor, it is not intended as a word processor and will not format the text. Its major drawback is the lack of a command to make the cursor jump to either end of a line.

Teleterm can also be used to make your computer emulate a specific type of terminal. Files come on the disk that will emulate most of the common types of terminals. In addition, a feature called "Creator/Editor" asks the user a myriad of questions about how the computer should act in terminal mode. Once these questions have been answered, the results may be saved as a disk file. If you know what is expected of a terminal, you should be able to use *Teleterm* to emulate any kind of terminal.

Six different conversion tables within *Teleterm* can be edited by the user. These tables control characters going in and out of the RS-232 port, to the printer, to the video and from the keyboard. This feature becomes important if the other end sends characters that will make a mess. Changing the

RS-232 input conversion table will intercept those characters before they can cause trouble. The same procedure can prevent graphics characters from reaching the video display and wreaking havoc.

Teleterm can utilize the auto-dial feature of Hayes' and several other modems and will store up to 10 phone numbers to be recalled with a keystroke or two. There is also an unattended mode of *Teleterm* that will allow calls to be received or made at specified times without intervention of the operator. If you would like to call home and send files to your computer, this is a handy feature.

Teleterm is available in an IBM version that will run on the Tandy 1000, 1200 and many other compatibles. It also comes in a separate version for the Tandy 2000 (IBM version will not work on a 2000). There are also versions for the TRS-80 Model 4/4P, TRS-80 Models II/12/16 and a Xenix version.

(Telexpress, P.O. Box 217, Willingboro, NJ 08046, 609-877-4900, $199.95)

— Potter Orr

Hardware 100/200/1000/1200/2000

Zvert ZVT-630 Diablo Printer Emulator makes 'LaserJetting' Simple

The world of computer printing was changed forever when Hewlett-Packard unveiled the LaserJet, introducing a new breed of computer printers. Unfortunately, though, the world of word processing was still using the old breed of software that didn't exactly work with this new technological wonder. You see, the word processing software that most people were using at that time (and even still) knew only how to "talk" with the old faithful daisy wheel and dot-matrix printers. The LaserJet presented a whole new array of features and complexities.

Into this chaos came a wonderful product from Zvert Corporation — the ZVT-630 Diablo 630 Emulator. It is a magical box that fits between your computer and your LaserJet printer and makes the LaserJet think it's a "supercharged" Diablo 630, a popular daisy wheel printer.

Suddenly, your old faithful *WordStar, Multimate* or just about any old word processor you have can become LaserJet compatible. Your word processor can happily send Diablo 630 codes for centering, underlining, setting margins, etc., the ZVT-630 can change them around, and your LaserJet will think your computer is talking in *its* lingo.

In addition to translating Diablo codes into LaserJet talk, the ZVT-630 performs a couple other minor miracles. It converts signals from your computer's "normal" parallel printer interface to the RS-232 signals required by the LaserJet. It will also allow you to connect up to three computers to a single LaserJet printer (one parallel and two RS-232 serial). In this shared configuration, the Zvert box will automatically handle each computer's output and, if necessary, will put one computer's print job on hold while another's is being printed.

Aside from allowing one to easily use the LaserJet printer, the ZVT-630 adds

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a nice feature to the printer that normally requires programming or the purchase of an additional font cartridge (these cost about $250 each). The Zvert box will simulate bold printing. The standard Diablo code signals the emulator to take care of this automatically.

Because of the nature of this device, getting it connected and configured is not something the average user could do easily. Not that it is *that* difficult, there's just a lot of talk about Baud rates, DTRs and parity that might scare some people away. In its favor, however, the box comes preset to work with the most common configuration.

Once the box is set up, using it is as simple as flipping a power switch and pressing the "option select" button to put it in "emulation mode."

The manual supplied with the emulator is printed with (what else) a LaserJet printer. A good amount of space is devoted to connecting and setting the DIP switches on the box. However, there is little information on using the emulator's port sharing capabilities. A mark in the manual's favor, though, is the inclusion of a complete list of supported Diablo 630 control codes with comments on how they work with the emulator.

One of the nicer features put into this box is the "pass through" mode. It will force the box to send data straight through to the printer without translation. This mode is handy if you happen to have software set up specifically for the LaserJet printer, but still want to use the emulator for its other features.

The ZVT-630 worked flawlessly in our testing. If one does experience problems with the emulator, the self-test feature will print a report on its condition and DIP switch settings.

WordStar was used to test the emulator and, aside from some bugs in our version of the *WordStar* Diablo 630 driver, it worked beautifully. We printed the *WordStar* `PRINT.TST` file with the emulator. It was able to do boldface printing, underlining, "strike-out," superscripts, subscripts and variable-pitch printing perfectly. How nice it is to finally be able to use *WordStar* with the LaserJet.

There are some Diablo 630 codes the ZVT-630 will not recognize. For the most part, these are due to the differences between daisy wheel and laser printing. Most notable of these missing codes are those that control proportional printing and Diablo's *HYPLOT* graphics.

The ZVT-630 emulator adds some codes of its own to the standard Diablo set. These codes are for special support of the LaserJet printer. Codes are provided to switch between "portrait" (vertical) and "landscape" (horizontal) text orientation, select the number of copies, reset the printer and perform a self-test of the printer. A "transparent print" code is provided to allow you to pass through Hewlett-Packard codes directly to the printer.

In summary, if you are currently using a word processor that does not support the LaserJet and have or are contemplating purchasing a LaserJet, the Zvert ZVT-630 emulator would be a wise buy. If you currently have a Diablo 630 and want to upgrade to the speed of the LaserJet, this product is made for you.

(Zvert Corporation, 12421 Venice Boulevard, Suite 8, Los Angeles, CA 90066, $599)

— Danny Humphress

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The following products recently have been received by PCM, examined by our magazine staff and approved for the PCM *Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

Astro*Talk, accepts date, time and place of birth and generates accurate astrological data for use in determining horoscopes. *Matrix Software, 315 Marion Avenue, Big Rapids, MI 49307, (616) 796-2483. Requires Tandy 1000 or 1200, $39.95*

Chart-Master, translates data from popular spreadsheet programs into professional charts and graphs. Works with most popular plotters and dot-matrix printers as well as the Hewlett-Packard LaserJet printer. *DecisionResources, Inc., 25 Sylvan Road South, Westport, CT 06880, (203) 222-1974. Requires Tandy 1000 or 1200 with graphics, $375.*

Data Manager System, a personal filing system for the Tandy Model 100. Package includes manual and cassette software. *Tandy, distributed through Radio Shack stores nationwide. Requires a 16K Model 100, Catalog No. 26-3836, $39.95.*

Debug/Assembler, a program allowing you to write and edit 8085 assembly language programs on the Model 100. *Tandy, distributed through Radio Shack stores nationwide. Requires a 32K Model 100, Catalog No. 26-3823, $49.95.*

Diagram-Master, creates business diagrams such as organization charts and Gantt Schedules. Prints charts on plotter, dot-matrix or laser printer. *DecisionResources, 25 Sylvan Road South, Westport, CT 06880, (203) 222-1974. Requires Tandy 1000 or 1200 with graphics, $345.*

The Factory: Strategies in Problem Solving, a computer-aided instructional package for teaching strategy. Includes training diskettes and teacher guide. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030. Requires Tandy 1000, $59.*

Function Plotter, allows printing graphs of algebraic functions of one or two variables. Program supplied on cassette. *Tandy, distributed through Radio Shack stores nationwide. Requires a 16K Model 100 and any one of Tandy's plotters, Catalog No. 26-3834, $19.95.*

Hot Dog Stand: Survival Math Skills, a program designed to motivate students in grades 6-12 to develop practical mathematical skills. Includes diskette and teacher guide. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030. Requires Tandy 1000, $59.*

Inside 1-2-3, a self-study training package for users of *Lotus 1-2-3*. Includes tutorial manual and diskette containing practice worksheets. *Hayden, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604, (201) 393-6306. Requires Tandy 1000, 1200, or 2000, and* Lotus 1-2-3, $49.95

Inside Framework, a training package for users of Ashton-Tate's *Framework*. Includes self-paced learning manual and diskette with examples of *Framework* files. *Hayden, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604, (201) 393-6306. Requires Tandy 1000, 1200, or 2000, and* Framework, $49.95

Inside Symphony, a book/software package for training users of *Lotus Symphony*. Includes instruction manual and sample data diskette. *Hayden, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604, (201) 393-6306. Requires Tandy 1000, 1200, or 2000, and* Symphony, $49.95

Interactive Solutions, a cross-referencing program consisting of a database manager, spreadsheet and word processor. *Tandy, distributed through Radio Shack stores nationwide. Program supplied on plug-in ROM. Requires a 16K Model 100, Catalog No. 26-3844, $149.95.*

The King's Rule: Mathematics and Discovery, a program using a fantasy game format to teach the generation and testing of mathematical hypotheses. Includes diskettes and teacher guide. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030. Requires Tandy 1000, $59.*

MAI BASIC Four Inventory, an inventory program designed to work alone or in conjunction with other *MAI BASIC* Four accounting packages. *Tandy, distributed through Radio Shack stores nationwide. Requires Tandy 2000, Catalog No. 26-5214, $495.*

Offix, an integrated office productivity program with applications for filing, word processing, forms design and report generation. *Tandy, distributed through Radio Shack stores nationwide. Requires 256K Tandy 1000, 1200 or 2000, two floppy disk drives or one hard disk, Catalog No. 26-5325, $99.95.*

Sign-Master, a graphics program that creates text pages, headlines and other "word charts" on a plotter or dot-matrix printer. *DecisionResources, Inc., 25 Sylvan Road South, Westport, CT 06880, (203) 222-1974. Requires Tandy 1000 or 1200 with graphics, $245.*

Thoroughbred System I, a handicapping system designed to help horse racing fans earn more at the track. *PDS Sports, P.O. Box E, Torrance, CA 90507, (213) 516-66 88. Requires Tandy 1000 or 1200, $129.*

By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to PCM's reviewers for evaluation.

Using *BAREAD 2.1*

Bar code listings must be read in numerical order beginning with Line 1 and continuing through the last line of the listing. The computer display is used to prompt you as to which line to scan and give you warning messages should you happen to get out of step.

When you run *BAREAD*, it asks you to scan the first line of the bar code listing. This line contains the name of the program as well as the beginning of the program itself. The computer will sound a high-pitched beep whenever it's ready for you to scan a line. After a line has been successfully read, you'll hear a lower beep. A "blip-bloop" sound prompts you to turn your attention to the screen for a message. You'll hear this when you accidentally scan a line out of sequence.

After reading the first line, you continue scanning with the second line. Remember to wait for a high beep before scanning and then listen for a low beep to indicate a successful read.

Once the last line of the listing has been scanned, *BAREAD* will return control to the Tandy 100/200 menu screen. Note that the program you just scanned is now in the directory with a .DO extension.

The final step is to convert the .DO text file to a normal BASIC program. This is done quite simply by going to BASIC and loading the file with a command such as LOAD"TEST .DO" (if the program name were TEST). The program will load into BASIC and will be ready to run. To save the program in BASIC's compressed format (.BA extension), you'd type SAVE"TEST" (if the program were named TEST). You may then kill the .DO file with KILL "TEST.DO".

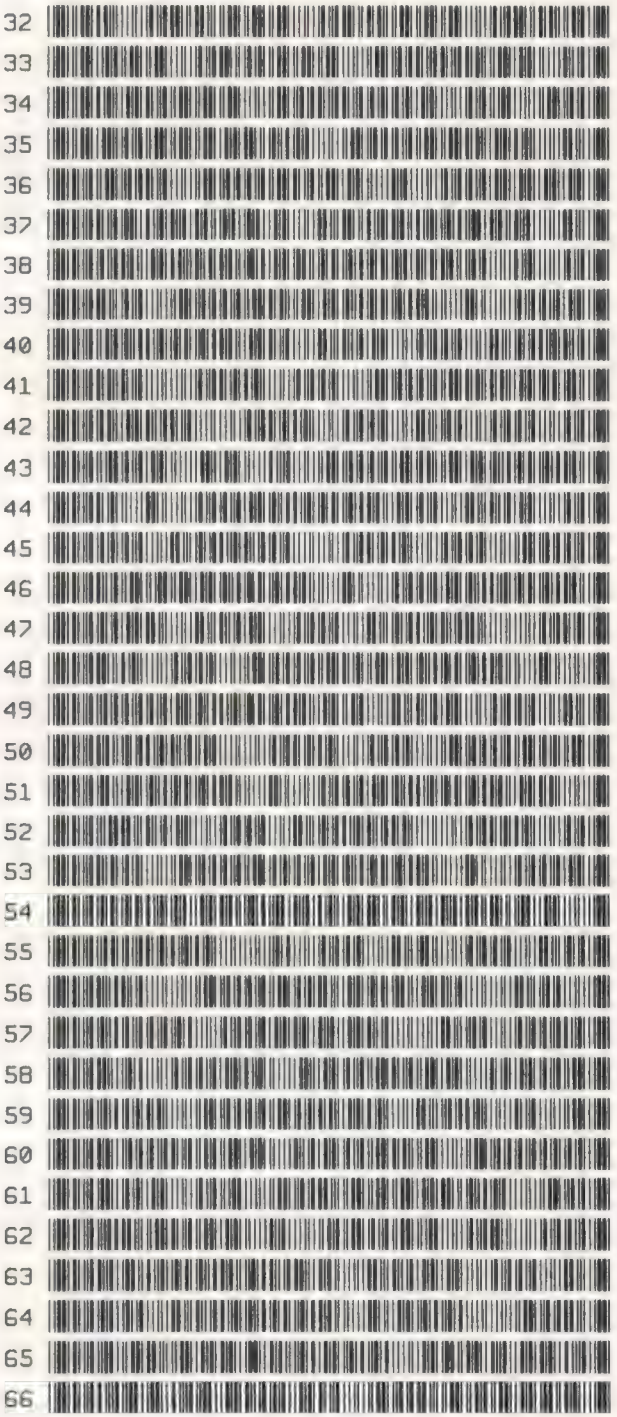
BAREAD 2.1

```
1ØØØ ' *** Initialize ***
1Ø1Ø ON ERROR GOTO 1Ø4Ø
1Ø2Ø CLEAR 1ØØØ:MAXFILES=2
1Ø3Ø GOTO 1Ø5Ø
1Ø4Ø IF ERR=5 THEN RESUME NEXT
1Ø5Ø ON ERROR GOTO Ø
1Ø6Ø RUNM "B3OF9"
1Ø7Ø OPEN "WAND:" FOR INPUT AS #1
1Ø8Ø UC%=-1
1Ø9Ø PC$="Ø123456789ABCDEFGHIJKLMNOPQRST
UVWXYZabcdefghijklmnopqrstuvwxyz- $+"
11ØØ DIM RW$(36)
111Ø ER$(1)="You must scan line 1 first!
"
112Ø ER$(2)="You've SKIPPED a line!"
113Ø ER$(3)="You've ALREADY SCANNED this
 line!"
114Ø ER$(4)="Code not PCM2/39 format!"
115Ø ER$(5)="Command not applicable here
!"
116Ø ER$(6)="You cannot skip this line!"
117Ø ER$(7)="Selected resume file not in
 computer!"
118Ø ' *** Read Reserved Words List ***
119Ø DATA BEEP,CLEAR,CLOSE,DATA,DEFDBL,D
```

```
EFINT,DEFNG,DEFSTR,ELSE,GOSUB,GOTO
12ØØ DATA INKEY$,INPUT,INSTR(,LCOPY,LEFT
$(,LINE(,LOADM,LPRINT,USING,MAXFILES
121Ø DATA MID$(,NEXT,PEEK,POKE,POWER,PRE
SET(,PRINT,READ,RESTORE,RETURN,RIGHT$(
122Ø DATA SOUND,SPACE$(,STRING$(,THEN
123Ø FOR I%=1 TO 36:READ RW$(I%):NEXT I%
124Ø ' *** Procedure Begins Here ***
125Ø CLS:PRINT@44,"PCM Bar Code Program
Reader v2.1"
126Ø LINE(2Ø,4)-(219,18),1,B:LINE(22,6)-
(217,16),1,B
127Ø NN%=1
128Ø GOSUB 166Ø:IF ER%>Ø THEN GOSUB 162Ø
:GOTO 128Ø
129Ø IF LL%=Ø AND INSTR("YN",IL$)>Ø THEN
 ER%=5:GOSUB 162Ø:GOTO 128Ø
13ØØ IF LL%=Ø THEN ON INSTR("ALSR",IL$)
GOTO 182Ø,189Ø,198Ø,2Ø5Ø
131Ø IF LL%=1295 THEN 135Ø
132Ø IF LL%<>NN% AND NN%=1 THEN ER%=1:GO
SUB 162Ø:GOTO 128Ø
133Ø IF LL%<NN% THEN ER%=3:GOSUB 162Ø:GO
TO 128Ø
134Ø IF LL%>NN% AND NN%>1 THEN ER%=2:GOS
UB 162Ø:GOTO 128Ø
135Ø IL$=RIGHT$(IL$,19)
136Ø IF LL%=1 AND NN%>Ø THEN GOSUB 178Ø
137Ø CL$=CL$+IL$
138Ø FOR I%=1 TO LEN(CL$)
139Ø    CH$=MID$(CL$,I%,1)
14ØØ    IF CH$="%" THEN GOSUB 151Ø:IF NL
% THEN 147Ø ELSE GOTO 144Ø
141Ø    IF CH$="/" THEN GOSUB 155Ø:IF NL
% THEN 147Ø ELSE GOTO 144Ø
142Ø    IF CH$="." THEN UC%=NOT(UC%):GOT
O 145Ø
143Ø    IF CH$=>"A" AND CH$<="Z" AND NOT
(UC%) THEN CH$=CHR$(ASC(CH$)+32)
144Ø    XX$=XX$+CH$:IF RIGHT$(XX$,1)=CHR
$(13) THEN PRINT#2,XX$;:XX$="":UC%=-1
145Ø NEXT I%
146Ø CL$=""
147Ø PRINT@2ØØ,SPACE$(8Ø);
148Ø IF LL%<>1295 THEN NN%=LL%+1:GOTO 12
8Ø
149Ø ' *** Done ***
15ØØ CLOSE:CALL 618Ø7!:CLEAR 5ØØ,HIMEM:M
ENU
151Ø ' *** Decode Reserved Word ***
152Ø NL%=Ø:IF I%>LEN(CL$)-1 THEN NL%=-1:
CL$="%":GOTO 154Ø
153Ø I%=I%+1:CH$=RW$(INSTR(PC$,MID$(CL$,
I%,1)))
154Ø RETURN
155Ø ' *** Decode Hex and Control Charac
ters ***
156Ø NL%=Ø:IF I%>LEN(CL$)-1 THEN NL%=-1:
CL$="/":GOTO 161Ø
157Ø I%=I%+1:IF INSTR("/%.",MID$(CL$,I%,
1))>Ø THEN CH$=MID$(CL$,I%,1):GOTO 161Ø
158Ø IF I%>LEN(CL$)-1 THEN NL%=-1:CL$=RI
GHT$(CL$,2):GOTO 161Ø
159Ø HX$=MID$(CL$,I%,2):CH$=CHR$((INSTR(
"Ø123456789ABCDEF",LEFT$(HX$,1))-1)*16+I
NSTR("Ø123456789ABCDEF",RIGHT$(HX$,1))-1
)
16ØØ I%=I%+1
161Ø RETURN
162Ø ' *** Error Codes ***
163Ø SOUND 5ØØØ,1Ø:SOUND 8ØØØ,1Ø:SOUND 5
ØØØ,1Ø
164Ø PRINT@22Ø-.5*LEN(ER$(ER%)),ER$(ER%)
;
165Ø RETURN
166Ø ' *** Get Code Line ***
167Ø PRINT@173,"";:PRINT USING "Scan lin
e ###";NN%
168Ø IF NN%=-1 THEN PRINT@173,"Scan any
line":GOTO 17ØØ
169Ø SOUND 5ØØ,5
17ØØ INPUT#1,IL$:ER%=Ø
171Ø FOR I%=1 TO LEN(IL$)
172Ø IF MID$(IL$,I%,1)="!" THEN MID$(IL$
,I%,1)="."
173Ø NEXT I%
174Ø IF LEN(IL$)<>1 AND LEN(IL$)<>21 THE
N ER%=4:RETURN
175Ø IF LEN(IL$)=1 THEN LL%=Ø:RETURN
176Ø LL$=LEFT$(IL$,2):LL%=(INSTR("Ø12345
6789ABCDEFGHIJKLMNOPQRSTUVWXYZ",LEFT$(LL
$,1))-1)*36+INSTR("Ø123456789ABCDEFGHIJK
LMNOPQRSTUVWXYZ",RIGHT$(LL$,1))-1
177Ø RETURN
178Ø ' *** Open Program File ***
179Ø PN$=LEFT$(IL$,6):IL$=RIGHT$(IL$,LEN
(IL$)-6)
18ØØ OPEN PN$ FOR OUTPUT AS #2
181Ø RETURN
182Ø ' *** Abort ***
183Ø BEEP:BEEP:BEEP
184Ø PRINT@2Ø9,"ABORT!  Are you sure?";
185Ø INPUT#1,AN$
186Ø IF INSTR("YN",AN$)=Ø THEN BEEP:PRIN
T@251,"Scan 'YES' or 'NO'":GOTO 185Ø
187Ø PRINT@2ØØ,SPACE$(8Ø);
188Ø IF AN$="Y" THEN CLOSE:KILL PN$+".DO
":GOTO 149Ø ELSE GOTO 128Ø
189Ø ' *** Skip Line ***
19ØØ IF NN%=-1 THEN ER%=6:GOSUB 162Ø:GOTO
 128Ø
191Ø BEEP:BEEP:BEEP
192Ø PRINT@21Ø,"SKIP!  Are you sure?"
193Ø INPUT#1,AN$
194Ø IF INSTR("YN",AN$)=Ø THEN BEEP:PRIN
T@251,"Scan 'YES' or 'NO'":GOTO 193Ø
```

```
195Ø PRINT@2ØØ,SPACE$(8Ø);
196Ø IF AN$="Y" THEN NN%=NN%+1
197Ø GOTO 128Ø
198Ø ' *** Stop & Save ***
199Ø BEEP:BEEP:BEEP
2ØØØ PRINT@2Ø7,"STOP & SAVE! Are you sur
e?";
2Ø1Ø INPUT#1,AN$
2Ø2Ø IF INSTR("YN",AN$)=Ø THEN BEEP:PRIN
T@251,"Scan 'YES' or 'NO'":GOTO 2Ø1Ø
2Ø3Ø PRINT@2ØØ,SPACE$(8Ø);
2Ø4Ø IF AN$="Y" THEN 149Ø ELSE GOTO 128Ø
2Ø5Ø ' *** Resume ***
2Ø6Ø IF NN%<>1 THEN ER%=5:GOSUB 162Ø:GOT
O 128Ø
2Ø7Ø PRINT@254,"Resume Mode";
2Ø8Ø NN%=1:GOSUB 166Ø
2Ø9Ø IF LL%=Ø THEN ER%=5 ELSE IF LL%<>1
THEN ER%=1
21ØØ IF ER%>Ø THEN GOSUB 162Ø:GOTO 2Ø6Ø
211Ø PN$=MID$(IL$,3,6)
212Ø ON ERROR GOTO 214Ø
213Ø OPEN PN$ FOR INPUT AS #2:GOTO 217Ø
214Ø RESUME 215Ø
215Ø CLOSE #2
216Ø ER%=7:GOSUB 162Ø:GOTO 127Ø
217Ø CLOSE #2:OPEN PN$ FOR APPEND AS #2
218Ø NN%=-1:GOTO 128Ø
```

TAGR (FROM PAGE 14)



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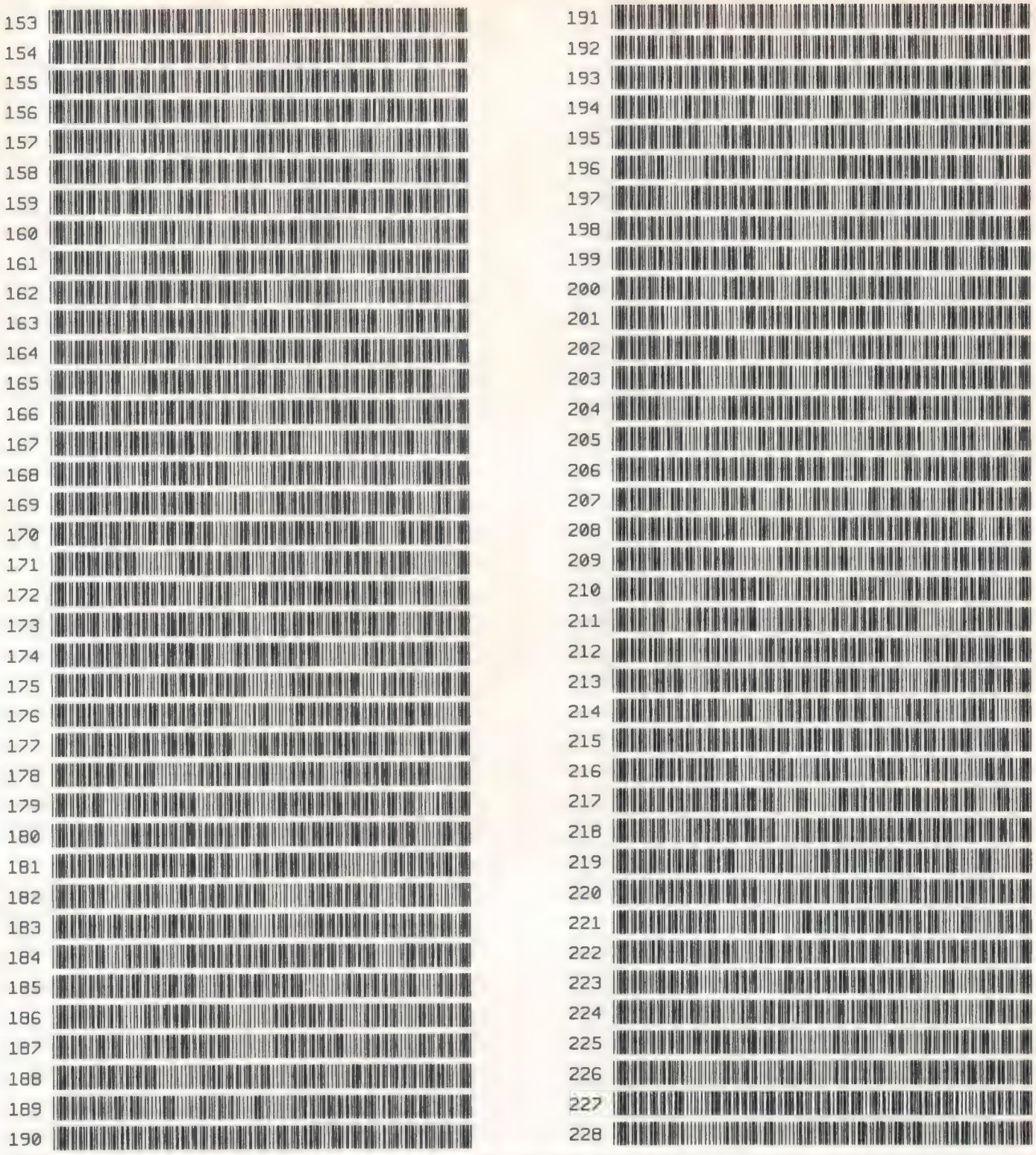
Abort	Skip Line	Stop & Save	Resume	Yes	No



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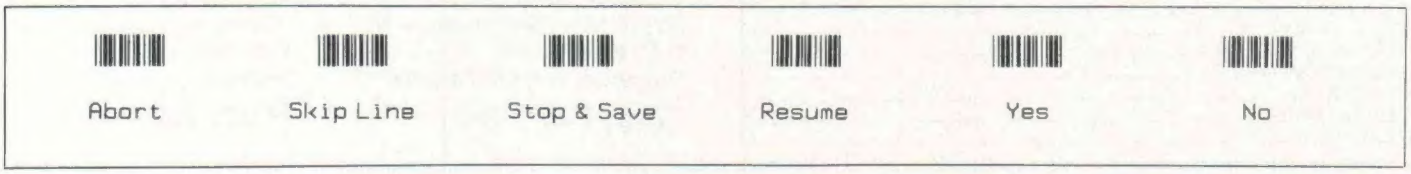
Abort
Skip Line
Stop & Save
Resume
Yes
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6 ROM BANK

plus powerful Nicad battery pack that gives 30 hours of power to your Model 100

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A joint PCSG/CRYPTRONICS project.

Now you can access LUCID, DISK+, WRITE ROM, RAM+ and others instantly.

The 6 ROM BANK plus battery pack lets you have the ultimate Model 100 system. When you get your unit just press in up to 6 ROMS into the sockets then push in a simple plug into your Model 100's ROM socket. The ROM bank has two posts on either end that insert into the two little holes on the underside of your Model 100.

The ROM bank props up the Model 100 at the same angle and height as those little legs you've seen. The ROM BANK itself is only about 1½" deep and it runs the width of your Model 100. It only weighs one pound. It not only installs instantly, but it pops free in a second if you need everything to lie flat in a briefcase.

Change from ROM to ROM with the touch of a thumb switch.

You can go from LUCID to WRITE to DISK+ to any other ROMS just by turning the thumb switch at the side of the ROM bank. The 6 ROM BANK is a sturdy well built construction that looks like it is a part of your Model 100.

What is also fantastic is that the ROM bank has a powerful NICAD battery and recharger built right in. This power source supplies up to 30 hours of life to your Model 100 with just 6 hours of recharge. What's nice is that it recharges right from your Model 100's power adapter. This is a quick charge system and if you need power in a hurry, you can get 6 hours of life for your Model 100 by just charging for an hour and half.

Suddenly, the Model 100 is a very powerful computer.

If you have the HOLMES portable disk drive with its powerful bundled database software package or the CRYPTRONICS 128K RAM expansion along with LUCID, WRITE ROM and DISK+ in the 6 ROM bank with its rapid rechargable NICAD power source, you have the ultimate portable system. It's all available only from PCSG.

As usual we don't want you to take our word for it. The 6 ROM BANK is sold on a 30 day trial. If you are not satisfied simply return within thirty days for a full refund. MC, VISA, AM. EX. or C.O.D.

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Write ROM — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit . . . surpassed our highest expectations for quality and clarity."

Lucid Spreadsheet: This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

Database: This is a relational data base like no other. You can do everything from mailing lists to invoices. No complicated pseudo-coding, you create input screens as simply as typing into TEXT. You are not limited by size; you can have as large an input screen as you wish. Prints out reports or forms, getting information from as many files as you like. Complete math between fields. Total interface with Lucid worksheets.

Outliner: Does everything that Thinktank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

Present Lucid and Write ROM owners can upgrade for $100. If you have both it's $75.

As usual PCSG sells the Super ROM on a thirty day guarantee. If for any reason you are not satisfied, simply return it for a full refund.

We are excited about this product. Super ROM gives the Model 100 the true power of a desktop. No other multi-program ROM has software that compares. But don't take our word for it. We invite you to make that comparison yourself. Priced at $199.95 on Snap-In ROM.

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